



LISTA CONTENTS

LMC
L36

COMMESSA - JOB L36	CLIENTE - CUSTOMER BALLESTRA S.p.a	APPARECCHIO – ITEM 1E35 - ITEM 65MX1
PURCH.ORDER 290966	N.F. - S.N.	MACCHINA – UNIT MISCELATORE CON DIAMETRO 1500

QUALITY BOOK

1. NAMEPLATE

2. MARKING AND MILL TEST REPORT

3. DRAWING

4. FACTORY ACCEPTANCE TEST REPORT

desmet ballestra
MILANO (ITALY)

V3VMABO L36

BALLESTRA JOB No. 1E35

ITEM

65MX1

YEAR

2010

DESIGN PRESS.

-0.05

Bar (g)

DESIGN TEMP.

70

°C



MESCOLATORE ROTANTE D.1500

02/10/09

PAGE 1
OF 1

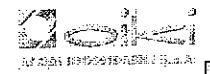
BV COGEIM S.r.l. - QUALITY CONTROL

200-200

<p>ArcelorMittal</p> <p>Maatschappelijke zetel: ArcelorMittal - Stainless Belgium NV/SA Koning Albert II-laan 35, 1030 Brussel, Belgium</p> <p>Correspondentieadres: ArcelorMittal Genk - Stainless Europe Swinhoeleiweg 5, 3600 Genk, Belgium Tel. +32 (0)89 30 21 11</p>		A01 MILL CERTIFICATE BS EN 10204/3.1										N-Nr-N 2009K0003718 A03			
		<p>CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1</p> <p>Approved acc. AD 2000-Merkblatt W0-TRD 100 by TÜV SÜD Industrie Service GmbH. Certified acc. PED 97/23/EC Annex I § 4.3 by Certification Body 0036 of TÜV SÜD Industrie Service GmbH with certificate No.: 314/2007/MUC. Renounced of counter signature agreed by TÜV SÜD (9/3/2007).</p>										A02			
												Z05			
												A01			
Manufacturer's works order number N° de la commande usine productrice		Surveyor's mark Cachet de l'expert		AMSE		Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfänger		Purchaser's order number N° de commande client Kundenbestellnummer				A07			
Werksauftragsnummer A08 8UA830027/04-2007/871/04		Stampel des Werkssachverständigen Z03				OIKI ACCIAI INOXSIDABILI SPA						N. 3735			
Packing list: 2009K901867						VIA PARADIGNA 95/A 43100 PARMA (PR)						Customer article number N° d'article client Artikelnummer des Kunden			
Product - Produit - Erzeugnis						Z01 ITALIE						A06			
COIL, COLD ROLLED, FINISH 2 B COIL, LAMEE A FROID, FINI 2 B COIL, KALTGEZOGLT, GEGLUETZT, GEZOGLT, LEIGHT NACHGEZOGLT				B02 Finish Présentation Ausführung		Steelmaking process Mode d'élaboration de l'acier - Stahlherstellungsverfahren						C07 Product delivery condition Etat de livraison du produit Lieferzustand			
EN 10028-7/08 WNR 1.4307/1.4301 EN 10068-2/05 WNR 1.4307/1.4301 ASTM A 240 (IM)-08 TYPE 304L/304 ASME SA 240-07 TYPE 304L/304				2B 2B 2B 2B		Electric arc furnace-VOD/AOD-Continuous casting Four à arc-VOD/AOD-Coulée continue Elektro-Ofen-VOD/AOD-Stahlgußanlage						C08 Solution treated: Hyper temper: Lösungsgegl.+abgeschreckt:			
						Any supplementary requirements Prescriptions supplémentaires - Zusätzliche Anforderungen						1050 °C			
						X2 CRNI 18-9						Forced air - Air forced Geföhlte Luft			
												D04			
AD 2000 W2/2006 -- AD 2000 W10/2007 -- EN 13445-2/2002															
ASTM A480/A480M-08B--ASME CODE SECT.2 PT A/07 - MAT. MERCURY FREE															
Identification of the product Identification du produit-Identifizierung des Erzeugnisses		B07		Dimensions Dimensions - Abmessungen						Number of pieces Nombre de pièces - Stückzahl					
Coll n. N° de bobine - Band Nr		Heat n. N° de coulée - Schmelz Nr		B09 Thickness Epaisseur - Dicke	B10 Width Largeur - Breite	B10 Length Longueur - Länge	B11					B08			
84605843		846058		3.00 mm	2000.00 mm							B13			
												27240 KG			
CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG															
		C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P	CO			
Required-Exigé Anforderung	% mini % maxi				8.00	18.00			0.100	0.015	0.045				
Cast Analysis Analyse coulée Analyse Schmelze		0.022	0.43	1.37	8.02	18.00			0.075	0.006	0.032	0.19			
		C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82		
												C83	C84		
												C85	C86		
Bend test results are satisfactory EN ISO 7438															
Tests to verify batch and quality have been carried out : OK				α Ferrite		β Ferrite		Bend test results are satisfactory EN ISO 7438							
Tests de vérification de la conformité de la marche fournie : OK								Les essais de pliage sont satisfaisants 180 : ok							
Verwendungsprüfung wurde durchgeführt : OK		C04						C03 Ergebnisse des Biegeverstuchs entsprechen den Vorschriften							
MECHANICAL PROPERTIES - PROPRIÉTÉS MÉCANIQUES - MECHANISCHE WERTE EN 10002-1															
Location (1)		Room temperature - Température ambiante - Raumtemperatur								Test Temperature :					
Direction (2)		Yield strength Limite d'élasticité Dehngrenze		Tensile strength Résistance à la traction Zugfestigkeit		Elongation after fracture (A) Allongement après rupture Bruchdehnung		Hardness Duréte Härte		Yield strength Limite d'élasticité Dehngrenze		Tensile str. Résist. MPa Zugfestigkeit		Elongation % Allongement Bruchdehnung	
Required Exigé Anforderung		MPa		MPa		%		HRB C30		MPa		Rm		50mm	
mini maxi		Rp 0.2 %		Rp 1 %		Rm		50mm		Rp 0.2 %		Rp 1 %		50mm	
1 T		230		260		540 670		45 45		92					
Obtained Obtenu Ergebnisse		314		346		649		50 C12		47 C13		86 C15		C16	
C11		C14		C12		C13		C15		C31		C17		C18	
Impact strength test Essai de résilience Kerbschlagzähigkeits test		Corrosion test Test de corrosion Korrosionstest		Grain size E0.2 (T) / R(T) ASTM E 112		C04		C05		C32		C33		C34	
C40 Temp. C44		EN ISO 3651/2		B.0 C50		48 C51		C52		C53		C54		C55	
C42		:OK DSI		Internal Cleanliness :		A: B:		C: D:		C06		C07		C08	
Location of the sample (1) Emplacement de l'échantillon Lage des Probenabschnitte		The delivery is in accordance with the order La fourniture est conforme aux exigences de la commande Die Lieferung entspricht den Bestellbedingungen								Organisation inspection Organisation et/ou service contrôle Überwachungsabteilung					
1. Front - Début - Anfang 2. Back - Fin - Ende 3. Middle - Milieu - Mitte										Quality Department 21/01/2009 S. HILLEN					
Direction of the test pieces (2) Orientation des échantillons Prüferrichtung		Marking, inspection and measurement : without objection Contrôle de marque, d'aspects et de dimensions : sans réticence Prüfung der Stempelung, des Oberflächenaspekts und der Abmessungen : ohne Beanstandung								The inspector Le responsable Der Werkssachverständige					
T. Transverse - Travars - Quer L. Longitudinal - long - längs										D01					
C01															

This to declare that the material as described in here has been cut to :

LAM.304 6000X2000X3,0 2B



OUTOKUMPU

Avesta Works
ccm. Jan Egerstad

Your order - Ihre Bestellung - Votre commande

38

Purchaser - Besteller - Acheteur

L.S.I. LAMIERE SPECIALI INOX S.P.A.
VIA GIULIO NATTA-QUARTIERE SPIP 7/A
IT-43100 PARMA (PR)
ITALY

Dest.

L.S.I. LAMIERE SPECIALI INOX S.P.A.

Product - Erzeugnisform - Produit

Stainless Steel Hot Rolled, Coil
finish 1D, mill edge

Grade - Werkstoff - Nuance

Outokumpu 18-8L
TYPE 304/TYPE 304L/1.4307/1.4301

CERTIFICATE - ZEUGNIS - CERTIFICAT

1/1

EN 10204-3.1

Date - Datum	Load - Ladung - Chargem No	Cert.No - Zeugnis No
29-Jan-2009	IT7O-0052	1313838-EN
	Avesta order - Auftrag - Ordre	Invoice - Rechnung - Facture

561/528733 661/0442272

Requirements - Anforderungen - Exigences

ASTM A 240-06
ASME SA-240 2004 A05
EN 10088-2:2005
EN 10028-7:2000
AD 2000 W2, W10 & DIN 17441 (02.97)
EN 10051/ASTM A 480

Brand mark
Herstellerzeichen
Signe du producteur



Inspectors stamp
Abnname - Stempel
Estamp de l'expert



Melting process
Erschmelzungsort
Procédé de fusion

E+AOD

Extent of delivery - Lieferumfang - Etendue de livraison

Item	Pcs	Dimensions - Abmessungen - Dimensions			Heat No	Lot No
Pos.	Anzahl	kg	mm		Schmelze Nr	Los Nr
5	1	23580	10.00	1270	147493	- 002

7P78000*

Chemical composition - Chemische Zusammensetzung - Composition chimique

	C	Si	Mn	P	S	Cr	Ni	Nb	Cu	Co	N
Heat	.017	.34	1.65	.029	.001	18.14	8.11	.008	.34	.12	.067

Radioactive contamination check acc. IAEA recommendations: Satisfactory

Test results - Prüfergebnisse - Résultats détaillés (1N/mm² = 1 MPa) F = Front - Anfang - Début B = Back - Ende - Fin T = Transverse - Quer - Travers

Test Ref	Temp	RP 0.2	RP 1.0	RM	A5	2°	HB
Probe Ref							
Eprouv Ref	°C	N/MM2	N/MM2	N/MM2	%	%	HB
Min	+20	230	260	520	45	40	
Max				670			201
F T	+20	324	368	628	51	53	183
B T		325	369	626	51	53	183

Corrosion acc. ASTM A 262-E, EN ISO 3651-2A: Satisfactory

Heat treatment: Material temperature 1100 cel / Quenched (forced air + water)

Steel grade verification (PMI-spectroscopic): OK

Insp. and gauge measurement: Satisfactory

Approved acc. AD 2000 Merkblatt W0 by TÜV Nord Systems with renounce of countersignment

Certified acc. Pressure Equipment Directive (97/23/EC) by TÜV CERT-Certification body

for pressure equipment of the TÜV NORD GROUP; notified body, reg-no. 0045.

Outokumpu Stainless AB

Avesta Works

BOX 74

S-774 22 AVESTA

SWEDEN

Regoffice: Stockholm Sweden, Regno: 556001-8748

Telephone : +46 (0)226 813 57

Fax : +46 (0)226 813 16

V.A.T no : SE556001874801

This material is found to comply with order requirements

Authorized Inspector



CLIENTE ...3V CO GEIM.....

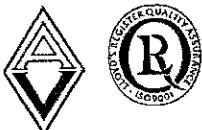
N° ORDINE ..54.51.9.....

FOTOCOPIA CONFORME AL MATERIALE ORIGINALE

LSI - LAMIERE SPECIALI INOX S.p.A. SERV. QUALITA'



Acciaierie Valbruna S.p.A.



36100 VICENZA (Italia) - Viale della scienza, 25 z.i.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Clients / Besteller/Purchaser/Client
3V COGEIM SRL - SOC. UNIPERSONALE
VIA FRIULI, 19
24044-DALMINE-BG

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/Item/Usine producitrice

Objetto Prove: Decapato Solubilizzato Laminato
Prüfgegenstand/Item Inspected/Finissage

Avviso di Spedizione: A-MI10004327
Lieferanzeige/Packing list/B.L.

Ordine nr: ORD N° 55011
Bestell/Vour order/Commande

Tipo di Elaborazione: E+AOD
Erhitzungsart/Melting process/Mode d'elaboration

CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005), 3.1

Certificato nr: MEST883722/2010/

Prüfung/Test/Essai

Conferma ordine nr: MI10003717
Werks/Our Order/Ref nr.

Marchio di Fabbrica:
Zeichen das Lieferwerkes
Trade mark
Sigle de l'usine productrice



Punzone del Collaudatore:
Stampel des Werkssachverständigen
Inspector's stamp/Pointon de l'assayeur



Specifiche:
Anforderungen / Requirements / Exigences

VAL STOCK 2005 1.4404/316L A
AMS 5648 K S31600 A
ASME SA182 2007 S31603 A 1
ASME SA276 2007 S31603 A 4
ASME SA479 2007 S31603 A 7
ASTM A193 2008B B8M CLASS1
ASTM A276 2008A S31603 A
ASTM A479 2008 S31603 A
EN 10088-3 2005 1.4401 A
EN 10269 99 1.4404
NACE MR0103 2005 S31600 A
NACE MR0175* 2003 S31603 B
(0) SEC.II PT.A 2007 EDITION ADD. 2008a
(1) SEC.II PT.A 2007 EDITION ADD. 2008a
(2) SEC.II PT.A 2007 EDITION ADD. 2008a
(4) SEC.II PT.A 2007 EDITION ADD. 2008a
(6) SEC.II PT.A 2007 EDITION ADD. 2008a
(8) Chemical analysis only and mechanical properties.
(A) * ISO 15156-3

AISI 316
AMS 5653 F S31603 A
ASME SA193 2007 B8M CLASS1 2
ASME SA320 2007 B8M CLASS1 5
ASTM A182 2009 S31600 A 8
ASTM A262 2002A PRACTICE E
ASTM A320 2008 B8M CLASS1
DIN 17440 96 1.4401 A
EN 10088-3 2005 1.4404 A
EN 10272 2007 1.4401 A
NACE MR0103 2005 S31603 A
QQ-S-763 F 316 A

AISI 316L
ASME SA182 2007 S31600 A (0)
ASME SA276 2007 S31600 A (3)
ASME SA479 2007 S31600 A (6)
ASTM A182 2009 S31603 A (9)
ASTM A276 2008A S31600 A
ASTM A479 2008 S31600 A
DIN 17440 96 1.4404 A
EN 10269 99 1.4401
EN 10272 2007 1.4404 A
NACE MR0175* 2003 S31600 (A)
QQ-S-763 F 316L A

0Chemical analysis only and mechanical properties.
1Chemical analysis only and mechanical properties.
3SEC.II PT.A 2007 EDITION ADD. 2008a
5SEC.II PT.A 2007 EDITION ADD. 2008a
7SEC.II PT.A 2007 EDITION ADD. 2008a
9Chemical analysis only and mechanical properties.
B* ISO 15156-3

Qualità: 1.4404/316/316L

Werkstoff/Grade/Nuance

Marca: APMI

Markenbezeichnung/Brand/Nuance

Pos. nr. Pos. nr. Item nr. Nr. de poste	Oggetto Gegenstand Product description Descrip. du produit	Dimensioni - mm Abmessungen Dimension Dimension	Tolleranza Toleranz, Allowance Tolerance	Lunghezza - mm Länge Length Longueur	Colata Schmelze Heat Coulée	Pezzi Stockzahl Pieces Pièces	Peso - KG Gewicht Weight Poids	Lotto nr. Losnr. Lot nr. Lot nr.
0010	Piatto	25,000 x 10,000	DIN1017	6090 / 6140	248532		24,0	826200540

Sono state soddisfatte tutte le condizioni richieste
Die gestellten Anforderungen sind lt. Anlage erfüllt
The material has been furnished in accordance with the requirements
Le matériau a été trouvé conforme aux exigences

Controllo antimesscolanza: OK
Verwechslungsprüfung: spektroanalytisch durchgeführt
Antimixing testing performed: spectroanalytical
Contrôle antimélange fait: r.a.s.

Controllo visivo e dimensionale: soddisfa le esigenze:
Besichtigung und Ausmessung: ohne Beanstandung
Visual inspection and dimensional checks: satisfactory
Contrôle visuel et dimensions: satisfaisant

TEST ALLO STATO DI FORNITURA										
Test on delivery condition			Prüfung auf lieferbereitem produkt			test a l'etat de livraison			Prueba sobre el material asi como entregado	
TEST	Provetta/Probstab Specimen/Éprouvette Lug/Jan Spiss. Breite/Dim. Dicke/ Width/Dim. Thickness Larg./Gauv./Epaisseur mm	°C Posiz. Saggio Position Sagging Experiment n	Sforzamento Streckgrenze Yield Stress Limits stretching Rp 0,2% N/mm2	Sforzamento Streckgrenze Yield Stress Limits stretching Rp 1% N/mm2	Resistenza Zugfestigkeit Tensile Strength Resistance à traction Rm N/mm2	Allungamento Bruchdehnung Elongation Allongement	Strizione Einschleifung Reduction of area Section	Resilienza Kontaktfestigkeit Impact Value Resistance KV J	Durezza Härte Hardness Durée	
Valori richiesti 1 Anforderungen/Required values Valeurs demandées	min max	205	240	515 690	40	40	-	50	100	140 215
A	10	20	L	324	357	628	55	57	67	229 226 231 181
TEST				min	max					
A	Dimensioni grano x ASTM E112						5			

1)L=longitudinal/längs, T=trasversale/tquer, C=tangenziale/tangential

Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata /Heat Schmelze/Coulée	min - max 0,030	1,00 2,00	1,25 18,00	16,50 2,00 2,50	- 1,00	10,00 13,00	-	0,040 0,030	0,100	-
248532	C % Si % Mn %	0,020 0,50 1,39	Cr % Mo %	17,00 2,07	Mn % Cu %	0,60 10,13	Ni % Co %	0,100 0,031	P % S %	N % 0,074

Vicenza, 11/06/10 VC0012 (Mod. MCER)	Il collaudatore di stabilimento / der Werkssachverständige / Works Inspector / L'agent d'usine M.Rizzotto	Pagina - 1 di 2
--	--	-----------------

Acciaierie Valbruna s.p.a.

36100 VICENZA (Italia) - Viale della scienza, 25 z.i.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Cliente / Besteller/Purchaser/Client
3V COGEIM SRL - SOC. UNIPERSONALE
VIA FRIULI, 19
24044-DALMINE-BG

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/Item/Usine productrice



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005), 3.1

Oggetto Prove: Decapato Solubilizzato Laminato
Prüfgegenstand/Item Inspected/Finisage

Avviso di Spedizione: A-MI10004327
Lieferanzeige/Packing list/B.L.

Ordine nr: ORD N°55011
Bestell/Vour order/Commande

Tipo di Elaborazione: E+AOD
Erschmelzungsaart/Melting process/Mode d' élaboration

Certificato nr: MEST883722/2010/
Prüfung/Test/Essai

Conferma ordine nr: MI10003717
Werks/Our Order/Ref nr.

Marchio di Fabbrica:
Zeichen des Lieferwerkes
Trade mark
Sigle de l' usine productrice



Punzone del Collaudatore:
Stempel des Werkssachverständigen
Inspector's stamp/Poinçon de l' assayeur



Intergranular corrosion test per ASTM A262 pract. E: ok.

I.Korrosion nach EN ISO 3651-2A Sensibilisierung : T1 : OK

Corrosion test per EN ISO 3651-2A sensitized T1 : OK

Melted and manufactured in Italy No welding or weld repair Material free from Mercury contamination

We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.

The Quality Management System is Certified acc. Pressure Equipment Directive [97/23/EC] Annex 1.s.4.3 by TUEV and LLOYD'S

Vicenza, 11/06/10
VCC012
(Mod. MCER)

Il collaudatore di stabilimento / der Werkssachverständige / Works inspector / L' agent d' usine

M.Rizzotto

Pagina - 2 di 2

Acciaierie Valbruna S.p.A.



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005), 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.i.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Clients / Besteller/Purchaser/Client
3V COGEIM SRL - SOC. UNIPERSONALE
VIA FRIULI, 19
24044-DALMINE-BG

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/Usina productrice

Oggetto Prove: Decapato Solubilizzato Laminato
Prüfgegenstand/Item Inspected/Finissage

Avviso di Spedizione: A-MI10004327
Lieferanzeige/Packing list/B.L.

Ordine nr: ORD N° 55011
Bestell/Votre order/Commande

Tipo di Elaborazione: E+AOD
Eischmelzungsart/Melting process/Mode d'élaboration

Certificato nr: MEST883725/2010/

Prüfung/Test/Essai

Conferma ordine nr: MI10003717
Werks/Our Order/Ref nr.

Marchio di Fabbrica:
Zeichen das Lieferwerkes
Trade mark
Sigle de l'usine productrice



Punzone del Collaudatore:
Stampel des Werkssachverständigen
Inspector's stamp/Poinçon de l'assayeur



Specifiche:

Anforderungen / Requirements / Exigences

VAL STOCK 2005 1.4307/304L A

AMS 5639 H S30400 A

AMS-QQ-S-763 B 304L A

ASME SA193 2007 B8 CLASS1 2

ASME SA320 2007 B8 CLASS1 5

ASTM A182 2009A S30400 A 8

ASTM A262 2002A PRACTICE E

ASTM A320 2008 B8 CLASS1

DIN 17440 96 1.4301 A

EN 10269 99 1.4301 AT

EN 10272 2007 1.4307 A

NACE MR0175* 2003 S30400 A A

QQ-S-763 F 304L A

(0) SEC.II PT.A 2007 EDITION ADD. 2008a

(1) SEC.II PT.A 2007 EDITION ADD. 2008a

(2) SEC.II PT.A 2007 EDITION ADD. 2008a

(4) SEC.II PT.A 2007 EDITION ADD. 2008a

(6) SEC.II PT.A 2007 EDITION ADD. 2008a

(8) Chemical analysis only and mechanical properties.

(A) * ISO 15156-3

AISI 304

AMS 5647 H S30403 A

ASME SA182 2007 S30400 A 9

ASME SA276 2007 S30400 A 3

ASME SA479 2007 S30400 A 5

ASTM A182 2009A S30403 A 9

ASTM A276 2008A S30400 A

ASTM A479 2008 S30400 A

EN 10088-3 2005 1.4301 A

EN 10269 99 1.4307 AT

NACE MR0103 2005 S30400 A

NACE MR0175* 2003 S30403 A B

AISI 304L

AMS-QQ-S-763 B 304 A

ASME SA182 2007 S30403 A (1)

ASME SA276 2007 S30403 A (4)

ASME SA479 2007 S30403 A (7)

ASTM A193 2009 B8 CLASS1

ASTM A276 2008A S30403 A

ASTM A479 2008 S30403

EN 10088-3 2005 1.4307 A

EN 10272 2007 1.4301 A

NACE MR0103 2005 S30403 A

QQ-S-763 F 304 A

0Chemical analysis only and mechanical properties.

1Chemical analysis only and mechanical properties.

3SEC.II PT.A 2007 EDITION ADD. 2008a

5SEC.II PT.A 2007 EDITION ADD. 2008a

7SEC.II PT.A 2007 EDITION ADD. 2008a

9Chemical analysis only and mechanical properties

B* ISO 15156-3

Qualità: 1.4307/304/304L

Werkstoff/Grade/Nuance

Marca: AISL

Markenbezeichnung/Brand/Nuance

Pos. nr.	Oggetto Gegenstand Product description Descrip. du produit	Dimensioni - mm Abmessungen Dimension Dimension	Tolleranza Toleranz Allowance Tolerance	Lunghezza - mm Länge Length Longueur	Colata Schmelze Heat Coulée	Pezzi Stückzahl Pieces Peces	Peso - KG Gewicht Weight Poids	Lotto nr. Losnr. Lot nr. Lot nr.
0040	Platto	40,000 x 30,000	DIN1017	6100 / 6160	249542		234,0	917002460

Sono state soddisfatte tutte le condizioni richieste

Die gestellten Anforderungen sind erfüllt.

The material has been furnished in accordance with the requirements

Le material a été trouvé conforme aux exigences

Controllo antimescolanza: OK

Verweichungsprüfung: spectralanalytisch durchgeführt

Antimixing testing performed: OK

Contrôle antimélange fait: r.a.c.

Controllo visivo e dimensionale: soddisfa le esigenze:

Beschädigung und Ausmessung, ohne Brantenbildung

Visual inspection and dimensional check:satisfactory

Contrôle visuel et dimensions: satisfaisant

TEST ALLO STATO DI FORNITURA									
Test on delivery condition			Prüfung auf Lieferberichtsprodukt			test a l'état de fourniture			Prueba sobre el material así como entregado
TEST	Provetta/Probett Spann- und Spannplatte Lang-durch Spess. Bredt Diam. Dicke Width Diam. Thick Lang, diam, spess mm	°C	Posiz. Saggio Position Locate Emplacement II	Snervamento Streckgrenze Yield Stress Unter elastische Rp 0,2% N/mm2	Snervamento Streckgrenze Yield Stress Unter elastique Rp 1% N/mm2	Resistenza Zugfestigkeit Tensile strength: Résistance à traction Rm N/mm2	Allungamento Bruchdehnung Elongation Allongement	A5 % E 4d %	Z RA %
Valori richiesti 1 Anforderungen/Required values Valeurs demandées	min max	210	230	520 680	45	40	-	50	100
A	10	20	L	334	374	632	54	56	67

TEST	min	max	6
A Dimensioni grano x ASTM E112			

1) L=longitudinale/längs, T=trasversale/quer, Q=Tangenziale/tangential

13 aprile 2010
M.Rizzotto

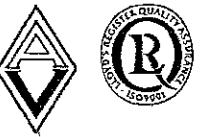
Vicenza, 11/06/10
VCQ008
(Mod. MCER)

Il collaudatore di stabilimento / der Werkssachverständige / Works inspector / L'agent d'usine

M.Rizzotto

Pagina - 1 di 2

Acciaierie Valbruna s.p.a.



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005), 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.i.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Cliente / Besteller/Purchaser/Client
3V COGEIM SRL - SOC. UNIPERSONALE
VIA FRIULI, 19
24044-DALMINE-BG

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/IItem/Usine productrice

Oggetto Prove: Decapato Solubilizzato Laminato
Prüfgegenstand/Item Inspected/Finissage

Avviso di Spedizione: A-MI10004327
Lieferanzeige/Packing list/B.L.

Ordine nr: ORD N°55011
Bestell/Your order/Commande

Tipo di Elaborazione: E+AOD
Erschmelzungsart/Melting process/Mode d' élaboration

Certificato nr: MEST883725/2010/
Prüfung/Test/Essai

Conferma ordine nr: MI10003717
Werks/Our Order/Ref nr.

Marchio di Fabbrica:
Zeichen des Lieferwerkes
Trade mark
Sigle de l' usine productrice



Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata/Heat Schmelze/Coulée	min - max 0,030	1,00	2,00	18,00 19,50	1,00	1,00	8,00 10,00	0,040	0,030	0,100	-	-	-	-	-
249542	0,022	0,50	1,60	18,03	0,44	0,44	8,08	0,030	0,028	0,088					

Intergranular corrosion test per ASTM A262 pract. E: ok.

I.Korrosion nach EN ISO 3651-2A Sensibilisierung : T1 : OK

Corrosion test per EN ISO 3651-2A sensitized T1 : OK

Melted and manufactured in Italy No welding or weld repair Material free from Mercury contamination

We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.

The Quality Management System is Certified acc. Pressure Equipment Directive [97/23/EC] Annex 1,s.4.3 by TUEV and LLOYD'S

Vicenza, 11/06/10
VCQ008
(Mod. MCER)

Il collaudatore di stabilimento / der Werkssachverständiger / Works Inspector / L' agent d' usine

M. Rizzotto *Rizzotto*

Pagina - 2 di 2

 ArcelorMittal Maatschappelijke zetel: ArcelorMittal - Stainless Belgium NV/SA Koning Albert II-laan 35, 1030 Brussel, Belgium Correspondentieadres: ArcelorMittal GmK - Stainless Europe Swijnenhuijweg 3, 3800 Genk, Belgium Tel. +32 (0)89 30 21 11		Mill Certificate BS EN 10204/3.1 CERTIFICAT DE RECEPION NF EN 10204/3.1 ABNAHMEPRUEFBURG DIN EN 10204/3.1										N-Nr-N 2009K0039553 A03													
		Approved acc. AD 2000-Merkblatt W0/TRD 100 by TÜV SÜD Industrie Service GmbH. Certified acc PED 97/3/EC Annex I & 4.3 by Certification Body 0074 of TÜV SÜD Industrie Service GmbH with certificate No. 3142007/MUC Reproduction of counter signature signed by TÜV SÜD (3/5/2007).										A02													
Manufacturer's works order number N° de la commande usine productrice Werksauftragsnummer 9UAR874367/06-20076/943/04		Surveyor's mark Cacher de l'expert Stempel des Werksachverständigen		Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfänger		Purchaser's order number N° de commandé client Kundenbestellnummer																			
Packing list: 2009K924415		VIA PARADIGMA 95/A 43100 PARMA (PR) ITALIE		Customer article number N° d'article client Artikelnummer des Kunden																					
Product - Produkt - Erzeugnis COILS, HOT ROLLED, ANNNEALED AND PICKLED COILS, LAMINÉ À CHAUD, RECUTS + DÉCALEZ COILS, WARMGEWALZT, GEMEULKT UND GEZOGLT				Steelmaking process Mode d'élaboration de l'acier - Stahlherstellungsmethode Electric arc furnace-VOD/AOD-Continuous casting Four à arc-VOD/AOD-Coulée continue Elektro-Ofen-VOD/AOD-Stahlgussanlage		Product delivery condition Etat de livraison du produit Lieferzustand																			
Steel designation Designation de l'acier Stahlbezeichnung EN 10028-7/08 NFR 1.4404/1.4402 ASTM A 240 MP-09 TYPE 316L/316 ASME SA 240-07 TYPE 316L/316 EN 10088-2/05 NFR 1.4404/1.4402		Finish Présentation ou Ausführung LD NO 1 NO 1 ID		Any supplementary requirements Prescriptions supplémentaires - Zusätzliche Anforderungen		Solution treated: Hypertonique: Lösungsgang salinoglycinée: Normal air - Air froid Geblockte Luft																			
				X2 CRNIMO 17-12-2						B04															
AD 2000 W2/2008 -- AD 2000 W10/2007 -- EN 13445-2/2002 NACE MR 0175 / ISO 15156-1 / ISO 15156-3 CORROSION TEST: ASTM A 262 - E / D2A(R2008) : OK												B05													
Identification of the product Identification du produit-Identifizierung des Erzeugnisses		Dimensions Dimensions - Abmessungen										Number of pieces Nombre de pièces - Stückzahl													
Coil n. N° de bobine - Band Nr 93701038		Leaf n. N° de feuille - Schmelz Nr 937010		Thickness Epaisseur - Dicke 6.00 mm	Width Largeur - Breite 1500.00 mm	Length Longueur - Länge	B06		B07		1														
							B08		B09		B13														
							B10		B11		B12														
							B12		B13		B14														
CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG												B15													
				C Required-Eig. Anforderung % min % max		Si 0.030 0.75		Mn 2.00 13.00		Ni 18.00 18.00		Cr 18.50 2.50		Mo 2.00 2.00		Ti 0.190 0.652		N 0.015 0.004		S 0.045 0.037		P 0.037 0.037			

1

 ArcelorMittal Maatschappelijke zetel: ArcelorMittal - Stainless Belgium NV/SA Kiezelstraat 66, 1000 Brussel, België Correspondentieadres: ArcelorMittal - Genk - Stainless Europe Swinnenweg 8, 8500 Genk, België Tel. +32 (0)9 30 21 13		A04 MILL CERTIFICATE BS EN 10204/3.1 CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1										N-Nr-N 2010K0019438 A03					
		Approved acc. AD 2000-Merkblatt W/WTRD 100 by TÜV SÜD Industrie Service GmbH. Certified acc. PED 97/23/EC Annex I § 4.3 by Certification Body 0536 of TÜV SÜD Industrie Service GmbH with certificate No. 3147007/MUC. Recognized of countersignature agreed by TÜV SÜD (93/2007).										A02					
Manufacturer's works order number N° de la commande usine productrice Worksauftragsnummer OUR917267/01-20076/004/01		Surveyor's mark Cachet de l'expert AMSE		Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfänger OLRI ACCIAI INOSSIDABILI SPA		Purchaser's order number N° de commande client Kundenbestellnummer SSS MAGGIO 4408											
														Address Stampa des Werkssachverständigen		Z05	
Packing list: 2010K011463																	
Product - Produkt - Erzeugnis																	
COILS, HOT ROLLED, ANNEALED AND PICKLED COILS, LAMINATE A CHAUD, RECUTTE + DECAPÉ COILS, VERSELENDELT, GEGLUED UND GEZIEZET						VIA PARADIGMA 95/A 43100 PARMA (PR) ITALIE											
Steel designation Désignation de l'acier Stahlbezeichnung		B02 Finish Präsentation Ausführung		B03 Steelmaking process Mode d'élaboration de l'acier - Stahlherstellungsverfahren								C70 Product delivery condition Etat de livraison du produit Lieferzustand					
EN 10028-7/09 NBR 1.4307/1.4301 ASTM A 260 (W)-09 TYPE 304L/304 ASME SA 260-07 TYPE 304L/304 EN 10088-2/05 NBR 1.4307/1.4301		ID NO 1 NO 2 ID		Electric arc furnace - VOD/AOD-Continuous casting Four à arc - VOD/AOD-Coulée continue Elektro-Schlacke - VOD/AOD-Stranggußanlage								Solution treated: Hypotempsé: Lösungsgesetzt-abgeschreckt: Forced air - Air forced Gebläse Luft					
												B04					
AD 2000 W2/2008 -- AD 2000 W10/2007 -- EN 13445-2/2002 NACE MR 0175 / ISO 15156-1 / ISO 15156-3 CORROSION TEST: ASTM A 262 - E / 02A(R2008) : OK														B05			
Identification of the product Identification du produit-Identifizierung des Erzeugnisses		B07		Dimensions Dimensions - Abmessungen						Number of pieces Nombre de pièces - Stückzahl							
Coupl. N° de bobine - Band Nr.		B08 Blatt n. N° de coulée - Schmelze Nr.		Thickness Epaisseur - Dicke		B09 Width Largeur - Breite		B10 Length Longueur - Länge		B11							
01551110		015511		3.00 mm		1500.00 mm								B12 Net weight Poids net - Netto Gewicht			
														5780 KG			
CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG														B06			
Required-Exigé % mini Anforderung % maxi		0.030 0.75		2.00 10.50		8.00 18.00											
Cast Analysis Analyse soulever Analyse Schmelze		0.028 0.43		1.43		8.03 18.09											
		C71 C72 C73		C74 C75 C76		C77 C78 C79		C80 C81 C82								C83 C84 C85 C86	
						C70 Permits		C70 Permits									
Tests to verify batch and quality have been carried out : OK Tests de vérification de la conformité de la nuance fournie : OK Verweichungsprüfung wurde durchgeführt : OK														B07			
Bend test results are satisfactory EN ISO 7439 Les résultats de pliage sont satisfaisants : ok C93 Ergebnis der Biegeversuch entspricht den Vorschriften														B08			
Location (1)		MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE EN 10002-1												C01			
		Room temperature - Température ambiante - Raumtemperatur												Test Temperature :			
Direction (2) Required Exigé Anforderung		Yield strength Limite d'élasticité Rp 0.2 % Rp 1 % 210		Tensile strength Résistance à la traction Zugfestigkeit MPa Rp 1 % 250		Elongation after fracture (A) Allongement après rupture Bruchdehnung % A5 520 700		Hardness Durée Härte Bruchdehnung % HRB C30		Yield strength Limite d'élasticité Rp 0.2 % Rp 1 % 45		Tensile str. résist. MPa Zugfestigkeit Rm 92		Elongation % Allongement Bruchdehnung A5			
1 T Obtained Obtenue Ergebnisse		282		317		631		55		54		81					
		C11		C14		C12		C13		C15		C31		C16		C17	
																C18	
Impact strength test Essai de résilience Kerbschlagarbeitstest				Corrosion test Test de corrosion Korrosionstest		E0.2 (E) / E1 (E) 8											
		C40 Temp. C41		EN 100 3651/2 : OK		44 C50		C51		C52		C53		C54		C55	
		C42				D51 Internal Clemminess :								A: B: C: D:		C56	
Location of the sample (1) Emploacement de l'échantillon Lage des Probenbeschafftes				The delivery is in accordance with the order La fourniture est conforme aux exigences de la commande Die Lieferung entspricht den Bestellbedingungen										Organisation inspection Organisme et/ou service contrôle Überwachungsabteilung		A05	
1. Front - Début - Anfang 2. Back - Fin - Ende 3. Middle - Milieu - Mitte		C61															
Direction of the test pieces (2) Orientation des épreuves Prüfeinrichtung				Marking, Inspection and measurement : without objection Contrôle de marquage, d'inspec et de dimensions ; sofern nichts Prüfung der Stempelung, des Oberflächenspekts und der Abmessungen : keine Beanspruchung										The inspector Le responsable Der Werkssachverständige		C02	
1. Transverse - Travers - Quer 2. Longitudinal - long - längs		C62															

This to declare that the material as described in here has been cut to :
NASTRO 304 1500X 3.0 CALDO X 6000

Exhibit 60/202010

<p>ACERINOX S.A. AVENIDA DEL CANTÓN DE CERTEAÑAS POLÍGONO LOS BARRIOS TEL.: (+34) - 955 62 33 00 FAX: (+34) - 955 62 33 11 E.C. SII: ES 13370 LOS BARRIOS (CÓRDOBA)</p>		<h1 style="text-align: center;">INSPECTION CERTIFICATE</h1> <h2 style="text-align: center;">CERTIFICADO DE INSPECCION</h2> <p style="text-align: right;">3.1</p> <p>ACCORDING TO EN 10204</p> <p>CERTIFICATE N° F0 2010 741160 180002⁺ CERTIFICADO N° AE 80950</p> <p>YOUR ORDER N° AE 80950 BO.40 KN 1553</p> <p>TRADE MARK INGENIERIA METALURGICA INSPECTOR'S STAMP INGENIERO METALURGICO STEELMAKING PROCESS PROCESO DE ACERO</p> <p>A.O.D.</p>									
CUSTOMER JOHN ACCIAI POSSIDABILI SPA VIA PARADISO 5/3A 43100 PARMA ITALIA		OUR ORDER N° 180002		YOUR ORDER N° AE 80950 BO.40 KN 1553							
REQUIREMENTS <small>STANDARDS / NORMAS</small> ASTM-A240E600/A480ME600; ASME-SA240 seccl-A E604; SA480ME604 EN 10088-2:2005 ASTM-A240E108/A480ME108//ASME seccl-A SA240E107; SA480ME107Addenda 2009		INTERGRANULAR CORROSION <small>CORROSION INTERGRANULAR</small> ASTM-A-262 PRACTICA E		GRADE <small>MATERIAL</small> A6x 240 TP-316 A6x 240 1.4404 A6x 240 TP-316L		FINISH <small>ZARZAMAS</small> N°1 1D N°1					
COIL / BOX <small>COLETA / CAJA</small> 01R2W3 E 04P9J7 B	CONTENT <small>CONTENIDO</small> 01R2W3 E 04P9J7 B	DIMENSIONS <small>DIMENSIONES</small> THICKNESS ESPESOR mm WIDTH ANCHO mm LENGTH LARGO mm			MARKS <small>MARCA</small> 16 3	QUANTITY <small>CANTIDAD</small> 1 1	TEST N° <small>PROBADA</small> 01R2W3 04P9J7				
CHEMICAL ANALYSIS / COMPOSICION QUIMICA (%)											
HEAT N° <small>CHAVE</small> P9J7 R2W3	C	CR	MN	MO	N	NI	P	S	SI		
	0,021 0,016	16,938 16,775	1,339 1,237	2,034 2,023	0,039 0,037	10,046 10,017	0,031 0,030	0,013 0,002	0,132 0,376		
MECHANICAL PROPERTIES / CARACTERISTICAS MECANICAS											
TEST N° <small>PROBADA</small> 01R2W3 04P9J7	<small>TEST</small> C T C T	<small>Rm</small> <small>N/mm²</small> 567,51 603,09	<small>Rp 0,2</small> <small>N/mm²</small> 309,58 311,43	<small>Rp 1,6</small> <small>N/mm²</small> 345,80 349,77	<small>A50</small> <small>%</small> 53,15 49,68	<small>A5</small> <small>%</small> 54,16 49,98	<small>HRB</small> 82,00 82,00				
REMARKS / OBSERVACIONES <small>Temperatura de horno entre 1050 y 1100 °C. The delivery is in accordance with the order</small>						SURFACE AND DIMENSIONAL CONTROL <small>INSPECCIÓN SUPERFICIE Y DIMENSIONAL</small>					
						SATISFACTORY <small>Satisfactoria</small> 					
						WORK INSPECTOR <small>INSPECTOR</small> 					
						Palomares, 12 ABRIL 2010 					

This to declare that the material as described in here has been cut to:
 NASTRO 316/L 1500X5,0 CALDO X 6000

SE70009

03/04/2010

<p>Confidentiality of management information and quality</p>		<h3 style="text-align: center;">Abnahmeprüfzeugnis INSPECTION CERTIFICATE</h3> <p>Prüf - Nr. F0 2010 741160 180001 E Inspection No.</p> <p>ACCORDING TO EN 10204 3.1</p> <p>NACH</p> <p><small>Bestätigungsabsichten des TÜV Bilden e.V. für die Gütekennzeichnung nach DIN EN 10204-3.1. Die Gütekennzeichnung ist auf der Lieferung des Herstellers zu überprüfen.</small></p>										
<p>Besteller - Customer: OIKI ACCIAI INOSSIDABILI SPA</p> <p>Prüfgegenstand - Article: BAND (COIL)</p> <p>Werkstoff - Normbez Standard - Grade of material: X2 CrNiMo 17-12-2 / X5 CrNiMo 17-12-2</p> <p>Anforderungen - Technical requirements: EN 10028-1/URB 100AD-2000-MERKBLATT Y2/N/10 DGRL 97/23/EG (PED) EN 10204 B</p> <p>Zeichen des Lieferwerks - Seal of the manufacturer: </p>		<p>Auftrags Nr. - Order n°: AE 80350</p> <p>Bestellung Nr. - Your order n°: BO 40-KN 1553</p> <p>Werkstoff Nr und Lieferzustand - Material n° and Condition of delivery: 1.4404/1.4401 1D</p> <p>Werksbez - Works Grade: Acx - 240</p> <p>Erschmelzungsmethode - Melting Process: A=AGG Verfahren AGG Process</p> <p>Keinzeichnung - Marking: Schmelze-Nr. - Heat N°</p> <p>Stempel des Sachverständigen / Inspector's stamp: </p>										
Pos. Nr. Item N°	Stückzahl/ Quantity	<p>Abmessung - Dimensions mm</p> <p>5.000x 1.500,00 5.000x 1.500,00</p>		Schmelze Nr. Heat N°	Probe Nr. Test N°							
3	1			P9J7 R2W3	04P9J7 01R2W3							
15	1											
Chemische Analyse - Chemical Composition (%)												
Schmelze-Nr. Heat N°	C	CR	MN	MO	N	NI	P	S	Si			
Anforderungen Requirements	0,030	18,500	2,000	2,000	0,110	13,000	0,045	0,015	1,000			
P9J7 R2W3	0,021 0,018	16,936 16,725	1,339 1,237	2,034 2,023	0,039 0,037	10,045 10,017	0,031 0,030	0,013 0,002	0,132 0,076			
Mechanische Eigenschaften - Mechanical Properties - Pr. Temp/T. Temp. 20° C												
Probe Nr. Test N°	Prob.-Lage pos. or test	Abmessungen des Probekörpers Dim. of specimen	Rm N/mm²	Rp 0,2 N/mm²	Rp 1,0 N/mm²	A5 %						
Anforderungen Requirements		Breite x Dicke, mm Width x Thickness mm	530,00 680,00	220,00	260,00	40,00						
D1R2W3 04P9J7	C T C-T	20,000 x 5,00 20,000 x 5,00	587,51 609,09	309,68 311,43	345,80 348,77	54,15 49,98						
<p>Beschichtung und Masskontrolle werden durchgeführt: O.K. Surface and dimensions controlled: O.K.</p> <p>Der Werkstoff ist beständig gegen interkristalline Korrosion gemäß EN ISO 3651-2. The material is resistant to intergranular corrosion test according to EN ISO 3651-2.</p> <p>Spektroskopische Identitätsprüfung: O.K. Spectrometrical identity test: O.K.</p> <p>Wärmebehandlung: Glühen bei 1050 - 1100 °C</p> <p>Heat treatment: Und Abschrecken mit Luft cooling with air.</p> <p>Die Lieferung entspricht der Bestellung. The delivery is in accordance with the order.</p>						<p>WERKSACHVERSTÄNDIGER WORK INSPECTOR A. Heredia</p> <p><i>ve a Heredia</i></p> <p>Palomares, 12 ABRIL 2010</p>						

This to declare that the material as described in here has been cut to:
NASTRO 316/L 1500X 5,0 CALDO X 6000

www.oiki.com



TERNINOX

Una società della ThyssenKrupp Acier Speciali Terni

COPIA CONFORME ALL'ORIGINALE
DDT NR. - ITEM NR. 03
Client Order NR. 55087 - Material Code

Pag. 1/1



SHANGHAI TIANBAO STAINLESS STEEL CO., LTD.

555 DONGRI ROAD, XINNONG IND. ZONE, ZHUJING TOWN,
JINSHAN DISTRICT, SHANGHAI 201503-CHINA
TEL: 86-21-57348218 FAX: 86-21-62997451

INSPECTION CERTIFICATE ACC. TO EN 10204 3.1

CUSTOMER: TERNINOX SPA
VIALE B. BRIN, 218
05100 TERNI ITALY

CERT NO.: ITA08057/7-16
INVOICE NO.: ITA08057/7
DATE: 06-Apr-09

MATERIAL: TP316/316L-W.NR.1.4401/1.4404-TUZ 2CND 1712/TUZ 6CND 1711
STANDARD: ASTM A312/A312M-00 ASME SECT. II PART.A SA312/SA312M-00 NACE MR 01.75-00,
PED 97/23/EC AFNOR NFA 49.117-DIN17458/07.85

DESCRIPTION OF COMMODITIES: STAINLESS STEEL SEAMLESS PIPES STATE OF DELIVERY: SOLID SOLUTION & PICKLED

HEAT NO.	CHEMICAL COMPOSITION (%)							
	C	Si	Mn	P	S	Cr	Ni	Mo
STAND.	MIN.					16.00	11.00	2.00
	MAX.	0.035	1.00	2.00	0.045	0.030	18.00	14.00
Y81153		0.018	0.64	0.77	0.039	0.002	16.10	11.05
								2.04

BUNDLE NO.	HEAT NO.	SIZE	QUANTITY
39-1	Y81153	13.72 MM x 2.24 MM x 6000 MM	30 PCS 118 KGS

		MECHANICAL PROPERTIES					
BUNDLE NO.		YIELD STRENGTH Mpa	TENSILE STRENGTH Mpa	ELONGATION %	HARDNESS TEST HRB	FLARING TEST	FLATTENING TEST
STAND.	MIN.	205	515	35			
	MAX.						
39-1		265	570	55	-	-	satisfactory

NONDESTRUCTIVE EXAMINATION		INTERGRANULAR CORROSION ACC. TO ASTM A262 E PRACTICE	HYDRO PRESSURE TESTS.
EDDY CURRENT TEST ACC. TO ASTM E426	ULTRASONIC TEST ACC. TO ASTM E213		
satisfactory	-	satisfactory	17MPa

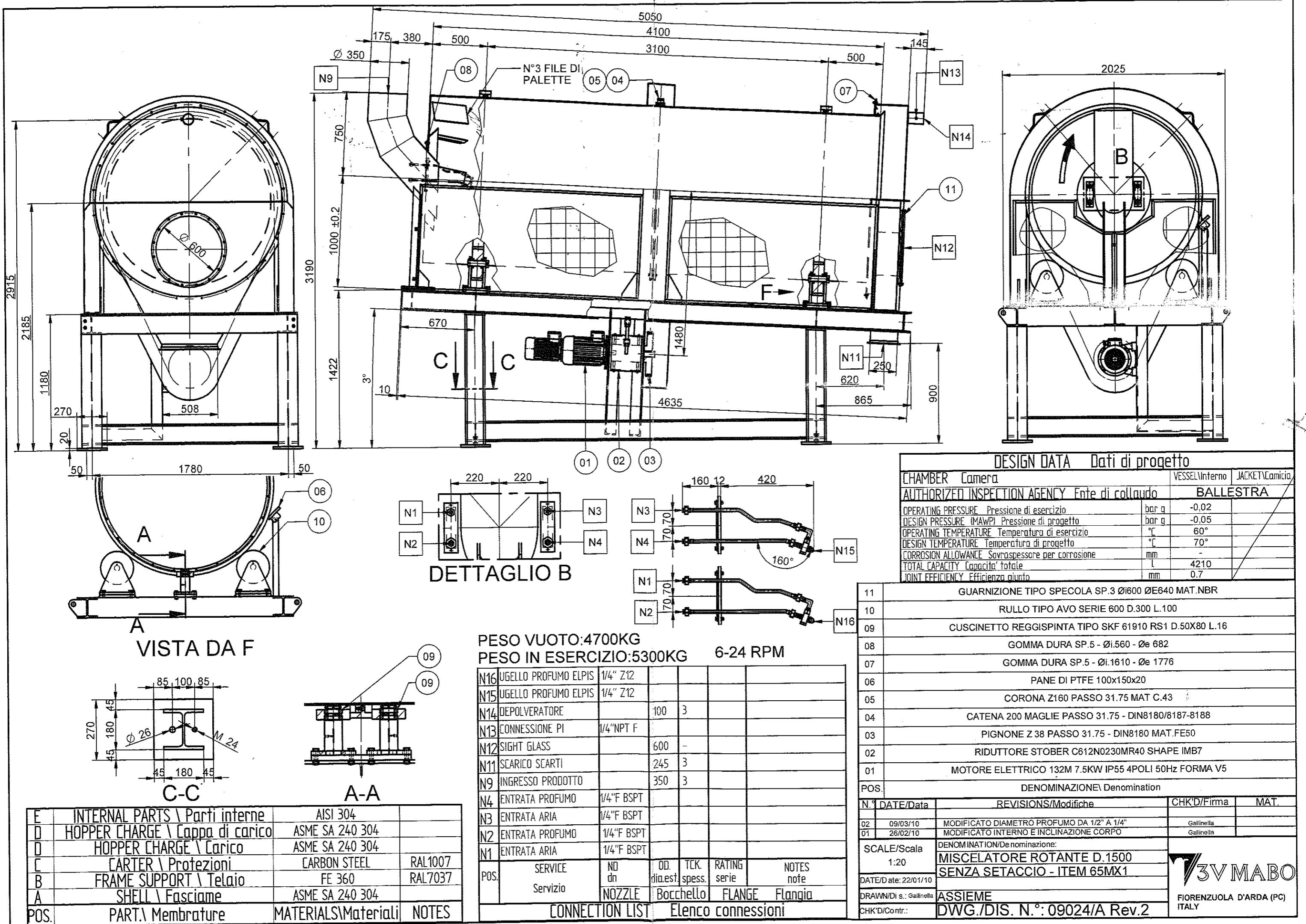
ADDITIONAL REMARKS: MATERIALS FREE FROM RADIOACTIVE CONTAMINATION

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE CONTRACT & THE SPECIFICATION, AND WE CONFIRM THAT P.M.I HAS BEEN DONE.

上海天宝不锈钢有限公司
SHANGHAI TIANBAO STAINLESS STEEL CO., LTD.

DATE

QUALITY TECHNOLOGY DIRECTOR



n 0.5 Y

93

A

○ 9N°24 FORI
EQUIDISTANTI

02

PUNTARE
TACK WELD

06

03

○ 1501^{+0.5}₋₁

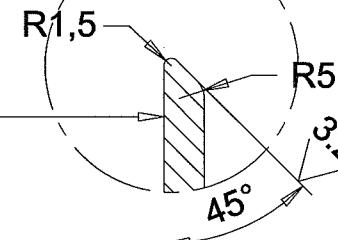
○ 1577

35

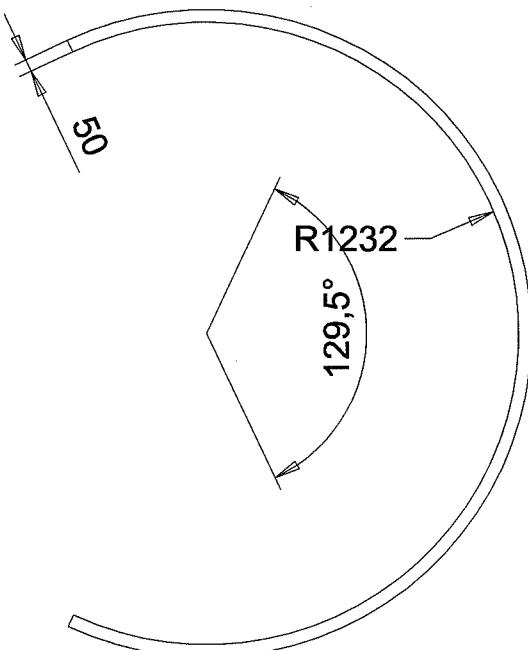
33

58

○ 1650 ±1



DETTAGLIO A



MOLARE A ZERO LE SALDATURE INTERNE

SVILUPPO POS.06

ART.42315

06	SHEET Th.6	38430	AISI 304	-	01
05	SHEET Th.8	39010	AISI 304	De.1650 Di.1513	01
03	SHEE Th.6	38430	AISI 304	4734X58	01
02	NUT M8	23577	A4	UNI 5588	24
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity\Q.tà

0 1st. ISSUE

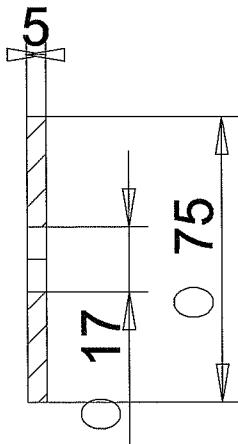
REVISION
RevisioneREVISION HISTORY
Storia delle revisioniDRAWN
AutoreDATE
DataThe master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.Desmet Ballestra s.p.a.
MILANO - ItalyDRAWING Nr. / Disegno Nr.
SB-PRS-00---/3

CUSTOMER Nr. / Nr. Cliente

JOB
Commissa**1E35**SHEET
FoglioPLANT
Impianto

1:10

TITLE
TitoloROTARY MIXER WITHOUT SIEVE
GASKETITEM
PosizioneWe reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.REFERENCE DWG.
Riferimento dwg.
09024/97

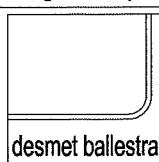


VERNICIARE RAL7037

12.5

01	TONDO D.75	-	FE 360	L.5	01
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Q.ty/Q.tà
0	1st. ISSUE			Gallinella	04/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni			DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



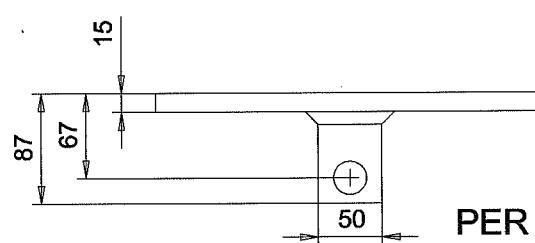
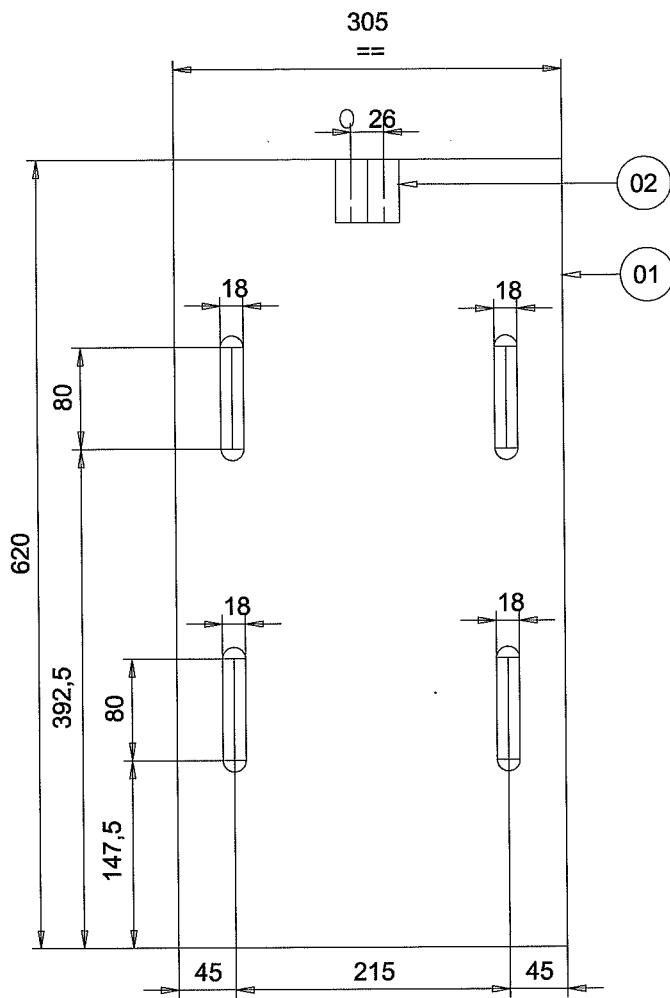
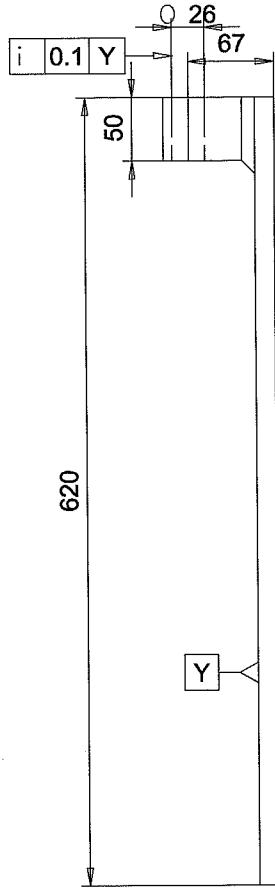
Desmet Ballestra s.p.a.
MILANO - Italy

DRAWING Nr. / Disegno Nr.
SB-PRS-00---/4

CUSTOMER Nr. / Nr. Cliente

JOB Commessa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE BODY	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/70

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known it third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



PER ART.42297 ✓

02	QUADRO 50X50	-	FE 360	L.72	01
01	LAMIERA Sp.15	-	FE 360	305X620	01
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà

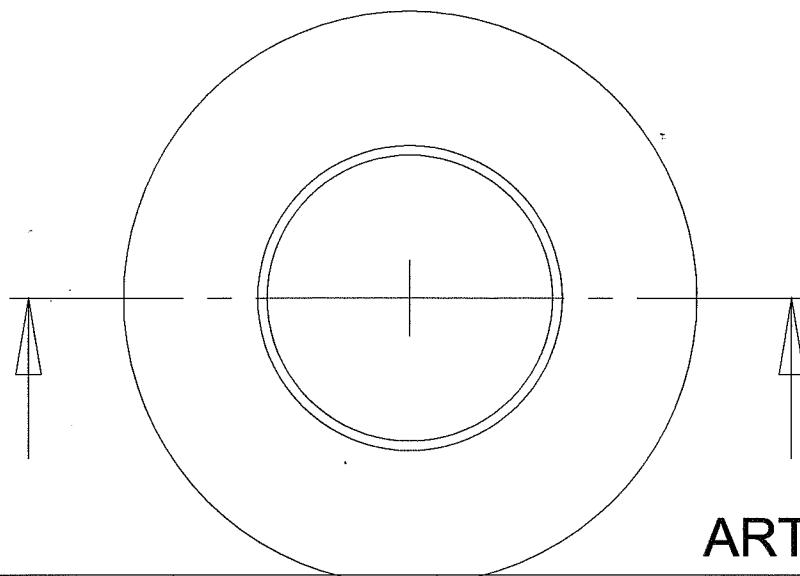
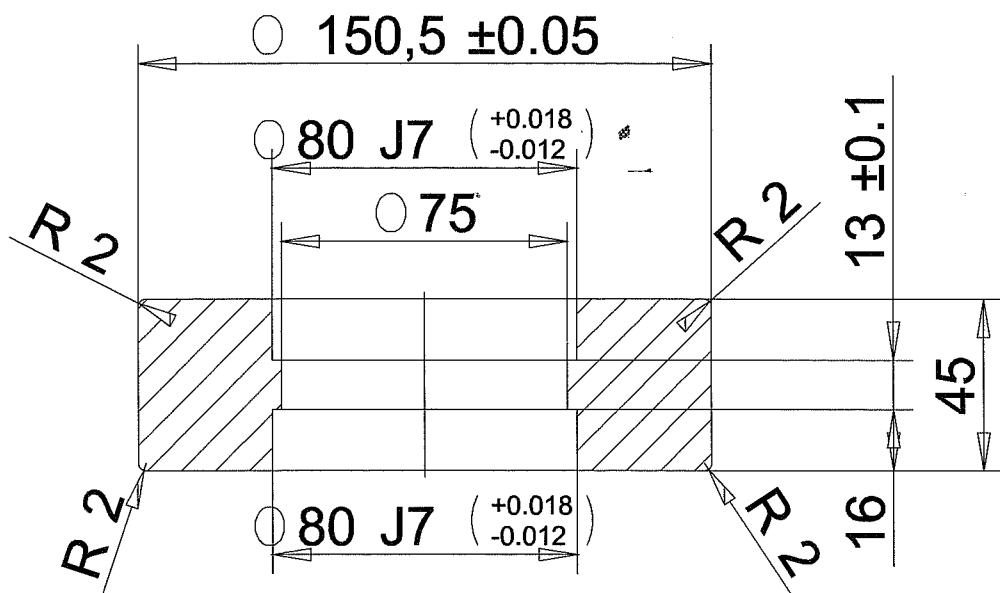
0	1st. ISSUE	Gallinella	27/01/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

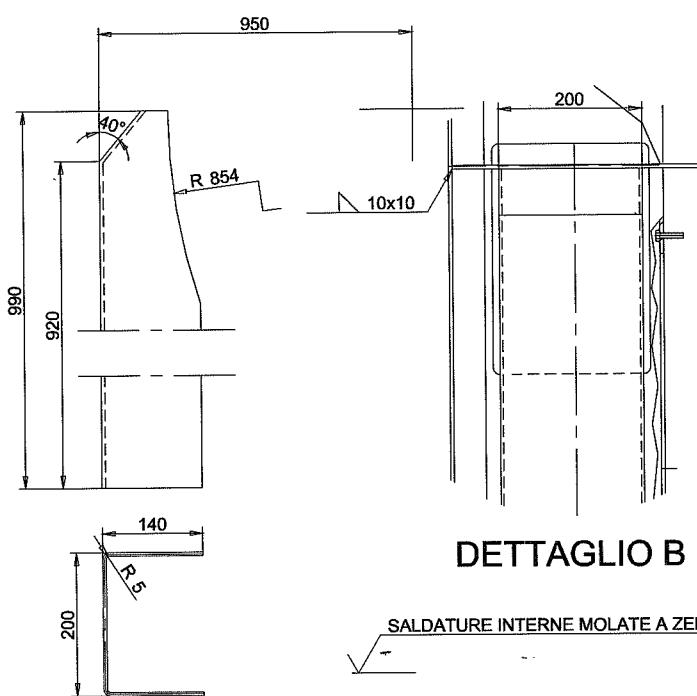
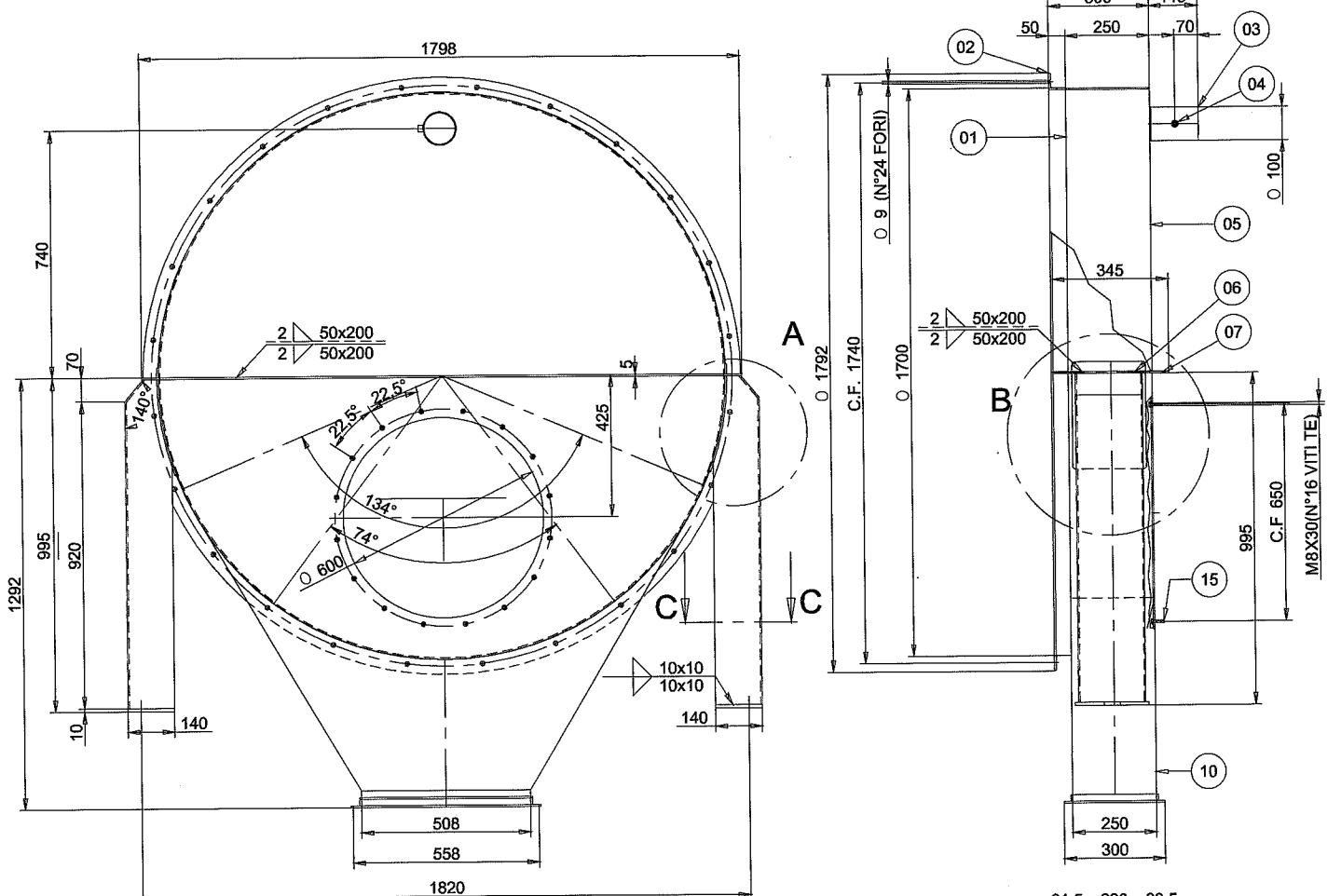
desmet ballestra	Desmet Ballestra s.p.a. MILANO - Italy	DRAWING Nr. / Disegno Nr. SB-PRS-00---/8
		CUSTOMER Nr. / Nr. Cliente

JOB Commissa	1E35	SHEET Foglio
PLANT Implanto		SCALA Scala
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE SUPPORT FOR GEAR REDUCER	ITEM Posizione
		REFERENCE DWG. Riferimento dwg.
		09024/62-11

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

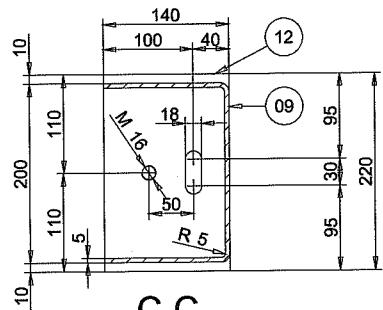


01	TONDO LAMINATO	D.160	C 45	L=53	1
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Q.ty/Q.tà
0	1st. ISSUE				
REVISION Revisione	REVISION HISTORY Storia delle revisioni				
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					
 desmet ballestra		Desmet Ballestra s.p.a. MILANO - Italy		DRAWING Nr. / Disegno Nr. SB-PRS-00---/22	
		CUSTOMER Nr. / Nr. Cliente			
JOB Commissa	1E35	SHEET Foglio			
PLANT Impianto		SCALA Scala		1:10	
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE ROLLER	ITEM Posizione			
		REFERENCE DWG. Riferimento dwg.	09024/31		
We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					



DETT.POS.09

ART.42307



DETTAGLIO A

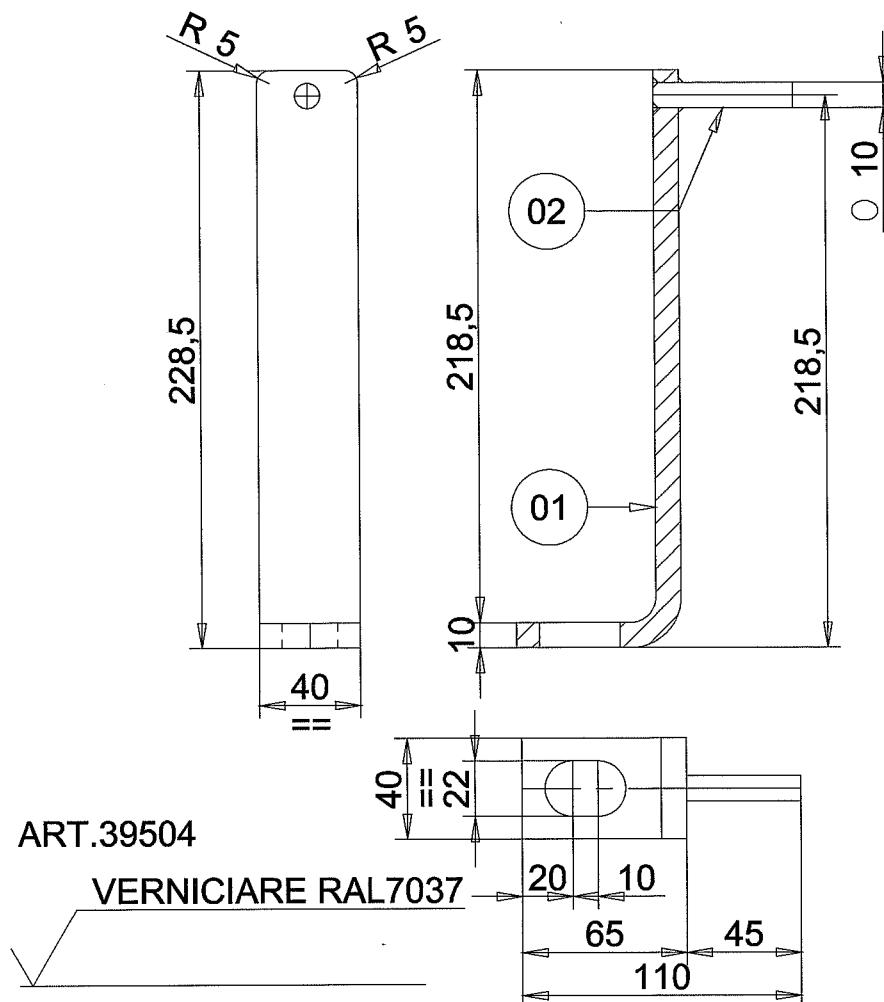
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà
15	VITE TE	M8X30	AISI 304	L.1650	16
12	LAMIERA Sp.10	00092	AISI 304	220X140	4
10	TRAMOGGIA	42666	AISI 304	09024/13-10	1
09	LAMIERA Sp.5	38318	AISI304	990x464	4
08	LAMIERA Sp.5	38318	AISI304	220x654	2
07	PIATTO 50x5	05102	AISI 304	L=1778	1
06	PIATTO 50x5	05102	AISI 304	L=345	2
05	LAMIERA Sp.4	38287	AISI 304	1700x1700	1
04	MANICOTTO	01361	AISI 316	1-4°F NPT	1
03	LAMIERA Sp.3	38285	AISI 304	350x145	1
02	PROFILATO EU56 50X5	01508	AISI 304	L=5800	1
01	LAMIERA Sp.4	38287	AISI 304	5400X250	1
POS. PART.\ Membrature					

0	1st. ISSUE	Gallinella	02/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

desmet ballestra	Desmet Ballestra s.p.a. MILANO - Italy	DRAWING Nr. / Disegno Nr.
JOB Commissa	1E35	CUSTOMER Nr. / Nr. Cliente
PLANT Impianto	SCALA Scala	1:10
TITLE Titolo	ITEM Parte	REFERENCE DWG. Riferimento disq.
ROTARY MIXER WITHOUT SIEVE EXTERNAL BODY		09024/13G

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



02	TONDO D.10	-	FE 360	L.55	01
01	PIATTO 40X10	-	FE 360	L.268.5	01
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà

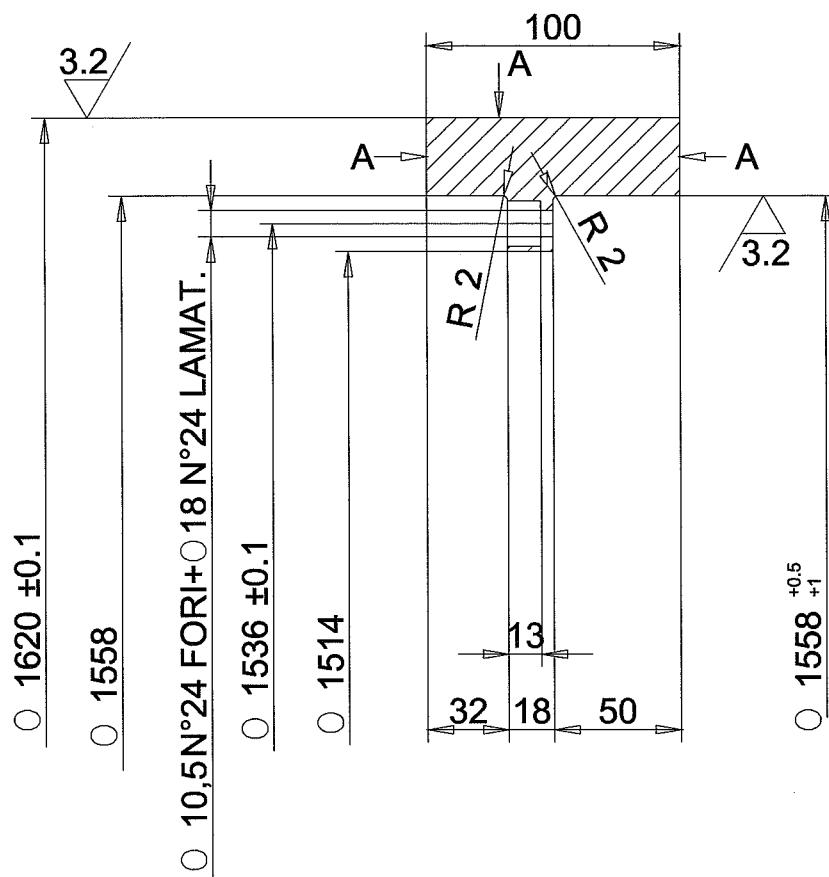
0	1st. ISSUE	Gallinella	09/05/09
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

	Desmet Ballestra s.p.a. MILANO - Italy	DRAWING Nr. / Disegno Nr. SB-PRS-00---/18
		CUSTOMER Nr. / Nr. Cliente

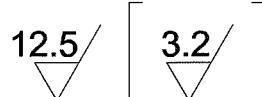
JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:2
TITLE Titolo	ROTARY MIXER D.1500 MECHANIC BLOCK	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09002/83

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



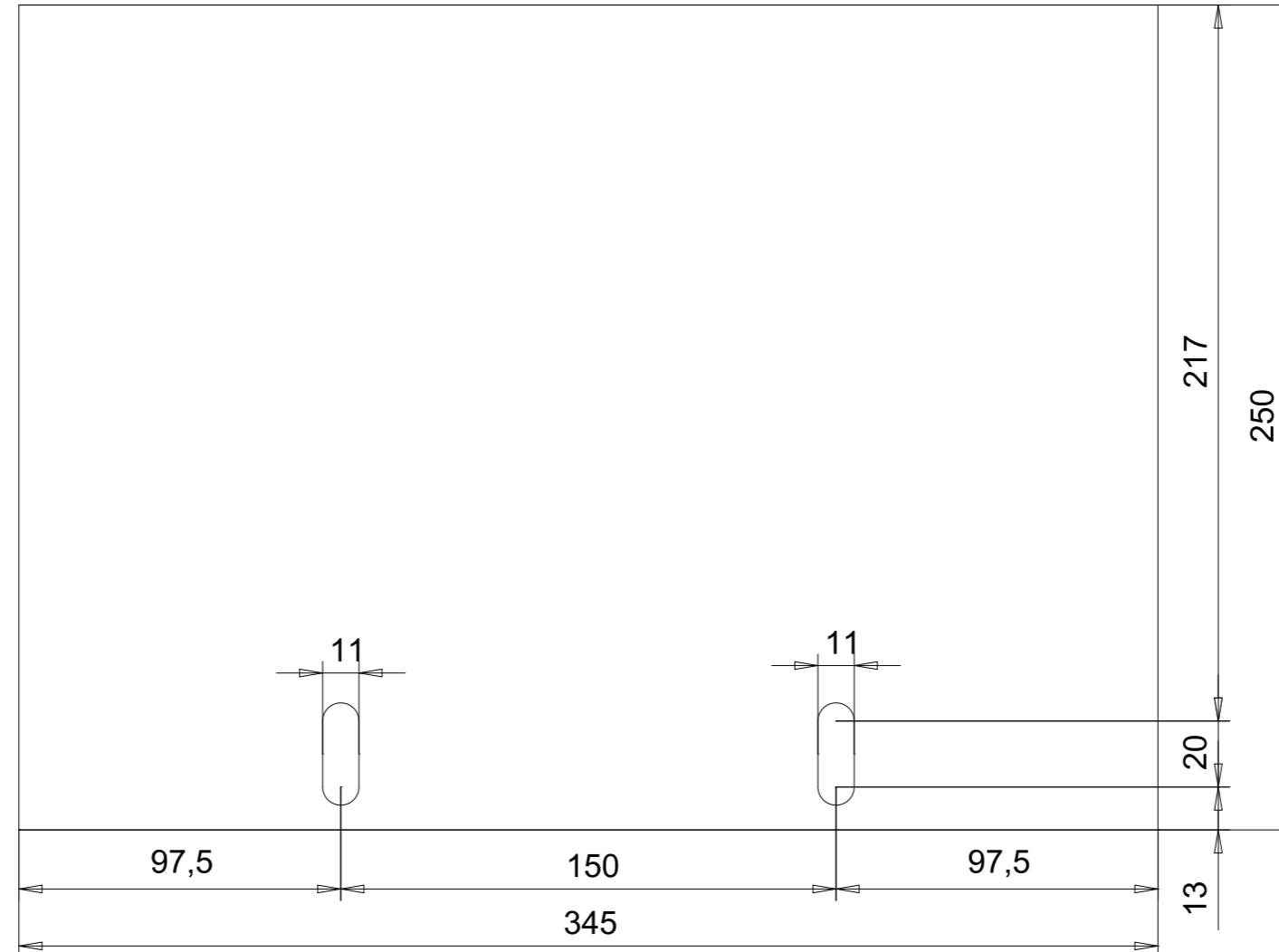
CALANDRARE,POI SALDARE E PASSARE ALLA LAVORAZIONE.
UNA VOLTA LAVORATO,TEMPIRE A INDUZIONE 60HR LE
SUPERFICI 'A'.PROFONDITA' DI TEMPRA 5mm

ART.39475



01	PIATTO 110X60	-	C45	L.4932	
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà
0	1st. ISSUE				Gallinella 27/04/09
REVISION Revisione	REVISION HISTORY Storia delle revisioni			DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					
 desmet ballestra		Desmet Ballestra s.p.a. MILANO - Italy			DRAWING Nr. / Disegno Nr. SB-PRS-00---/17
					CUSTOMER Nr. / Nr. Cliente
JOB Comessa	1E35			SHEET Foglio	
PLANT Impianto				SCALA Scala	1:2
TITLE Titolo	ROTARY MIXER D.1500 RING			ITEM Posizione	
				REFERENCE DWG. Riferimento dwg.	09002/81
We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					

3



ART.32990 ✓

01	LAMIERA LAMBR. AISI 304	345X250	1
POS. ART. \ Membrane / MATERIALS / DIMENSIONS / Q'ty /			

0	1st. ISSUE	Gallinella	23/01/06
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

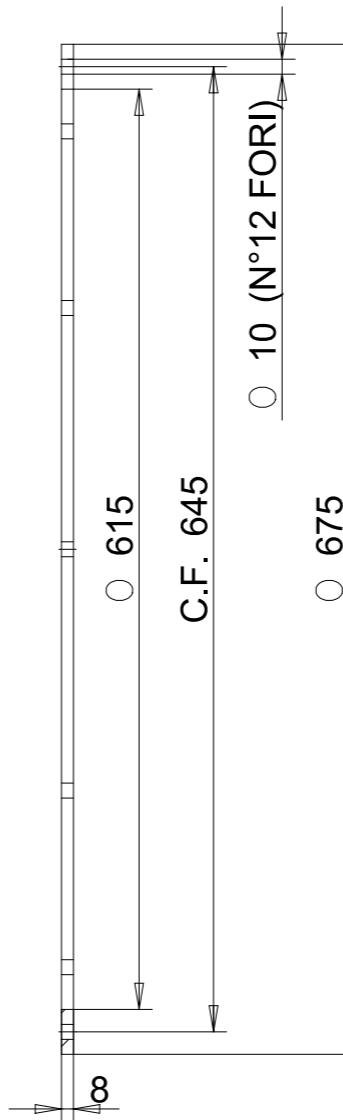
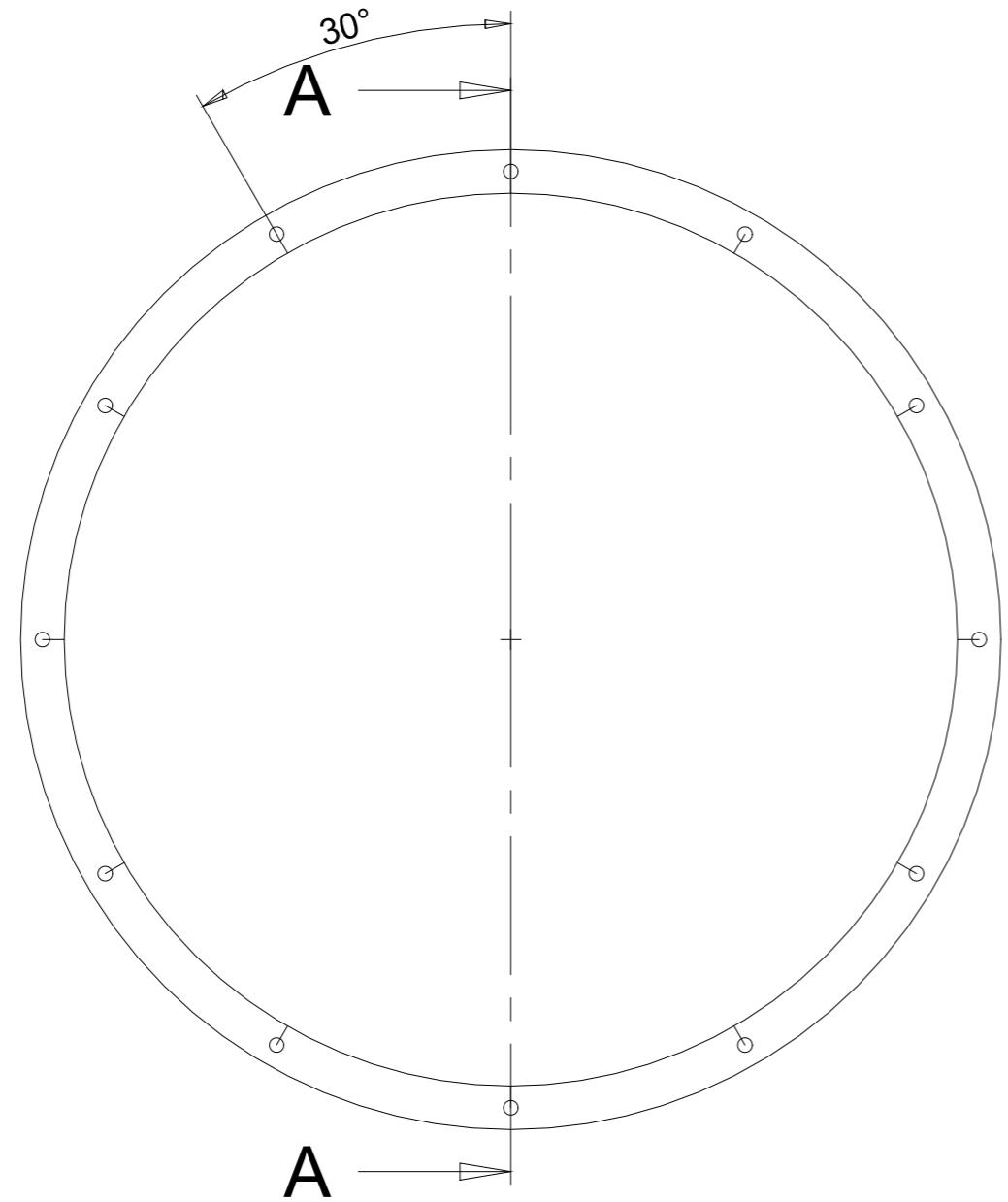
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



Desmet Ballestra s.p.a. MILANO - Italy	DRAWING Nr. / Disegno Nr. SB-PRS-00---/9
CUSTOMER Nr. / Nr. Cliente	

JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE BLADE	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	05010/1-21

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

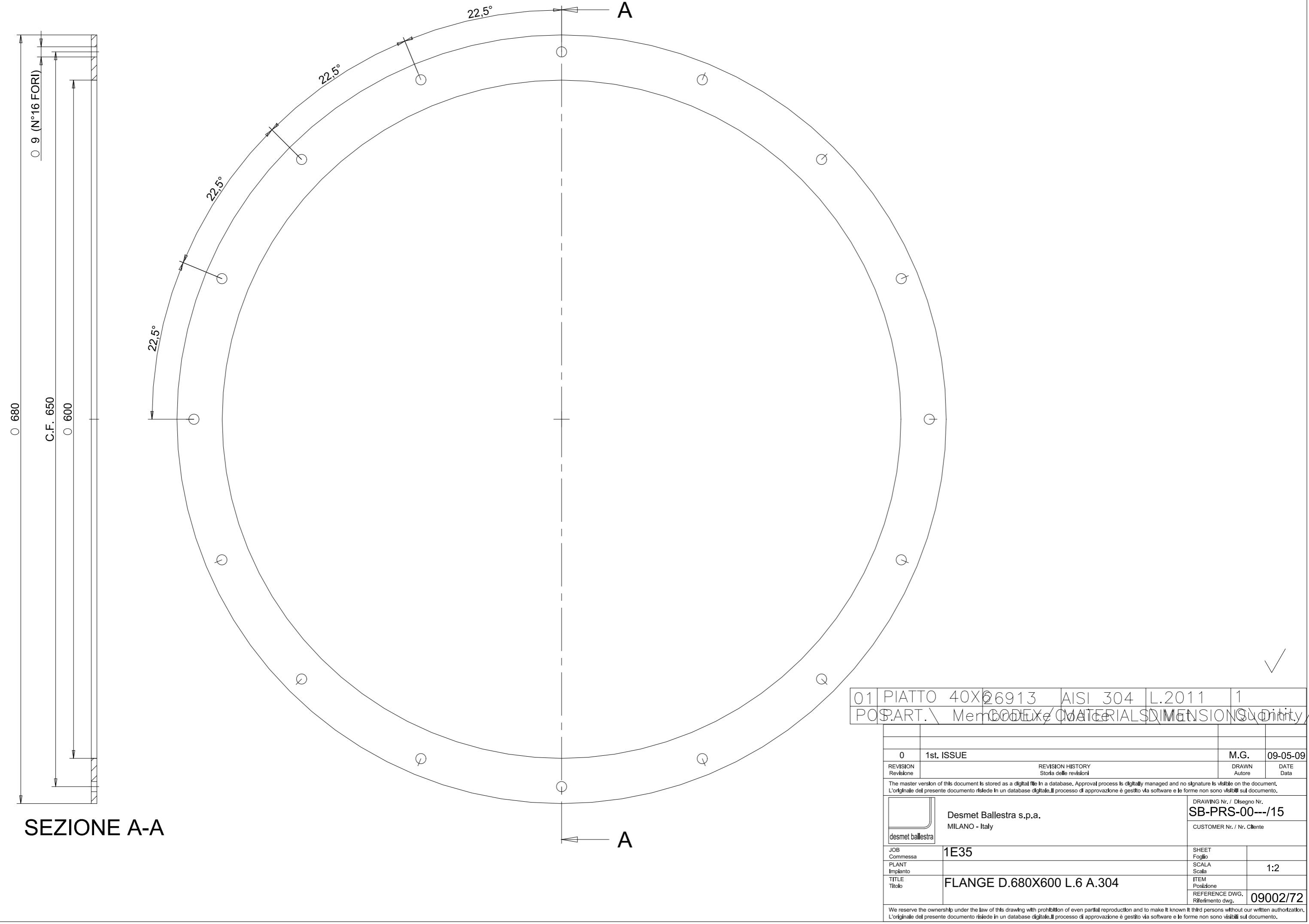


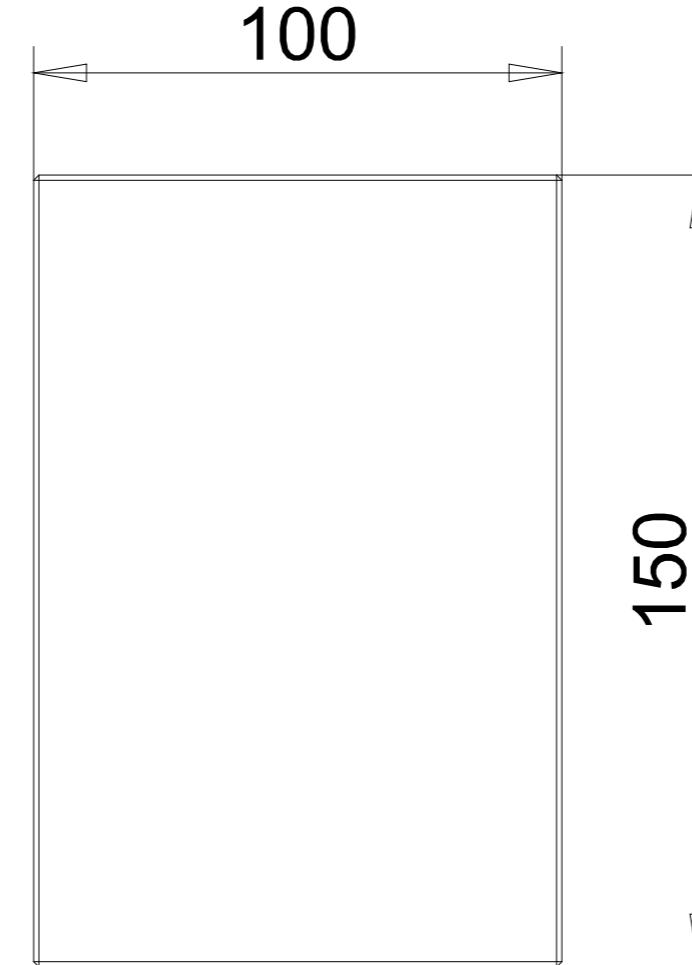
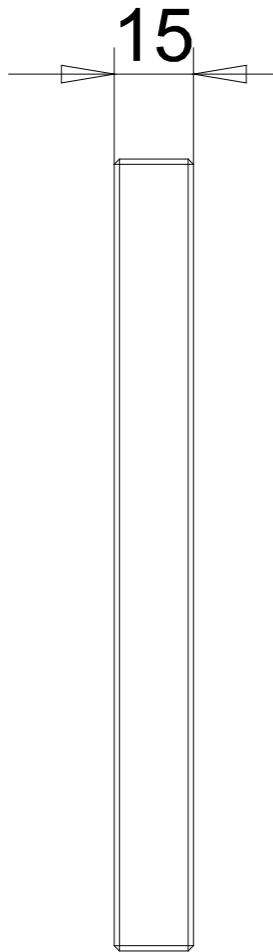
SEZIONE A-A

01	PIATTO 30X8	00848	AISI 316	L=2025	1
POS.	PART.\ Membrature	CODEX/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà

✓

0	1st. ISSUE	Gallinella	05-05-09
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			
	desmet ballestra	DRAWING Nr. / Disegno Nr. SB-PRS-00108/14	CUSTOMER Nr. / Nr. Cliente
Desmet Ballestra s.p.a. MILANO - Italy			
JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:5
TITLE Titolo	FLANGE D.675X615 SP.8 AISI 304		
	ITEM Posizione		
	REFERENCE DWG. Riferimento dwg.	09002/22	
We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			

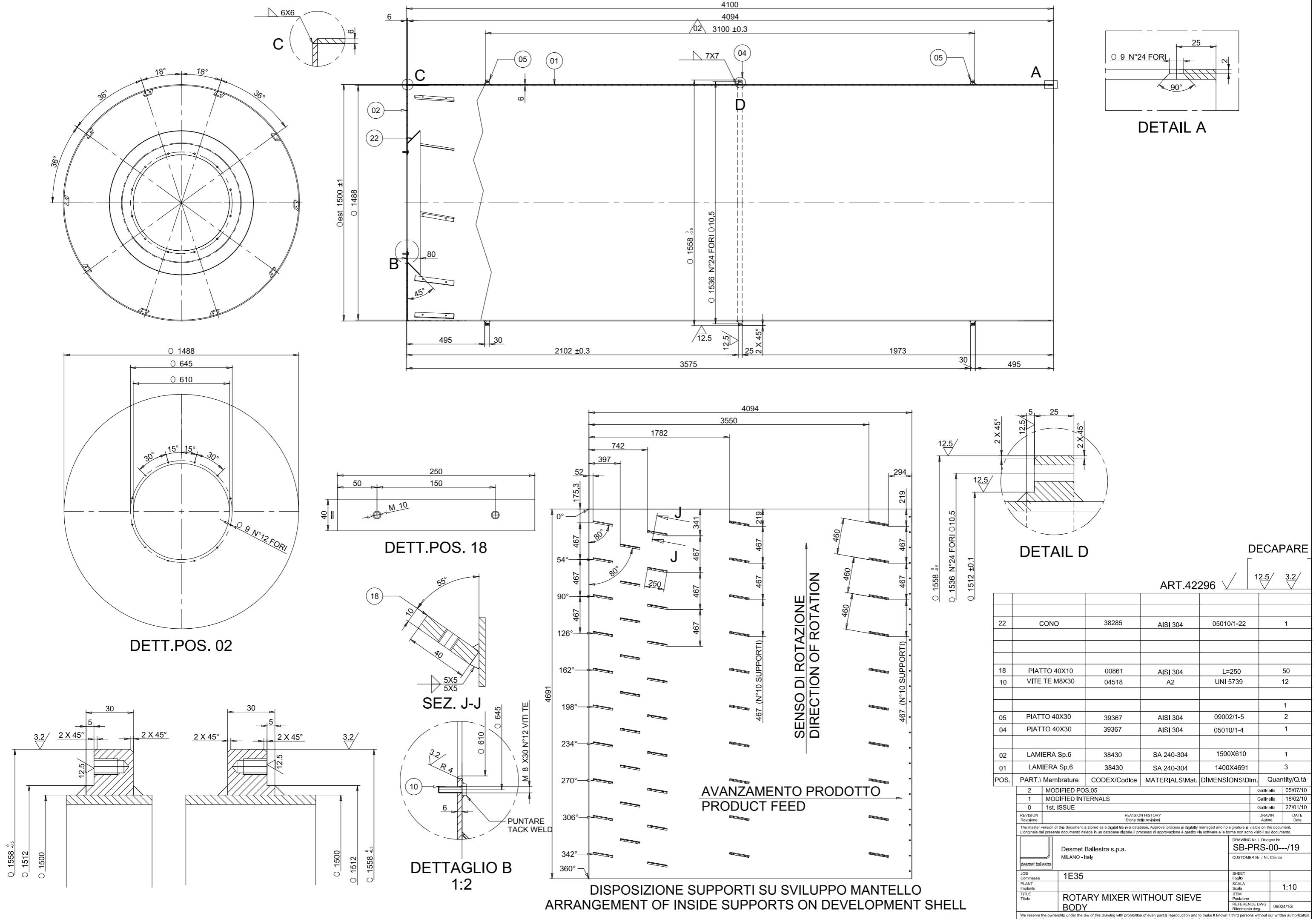


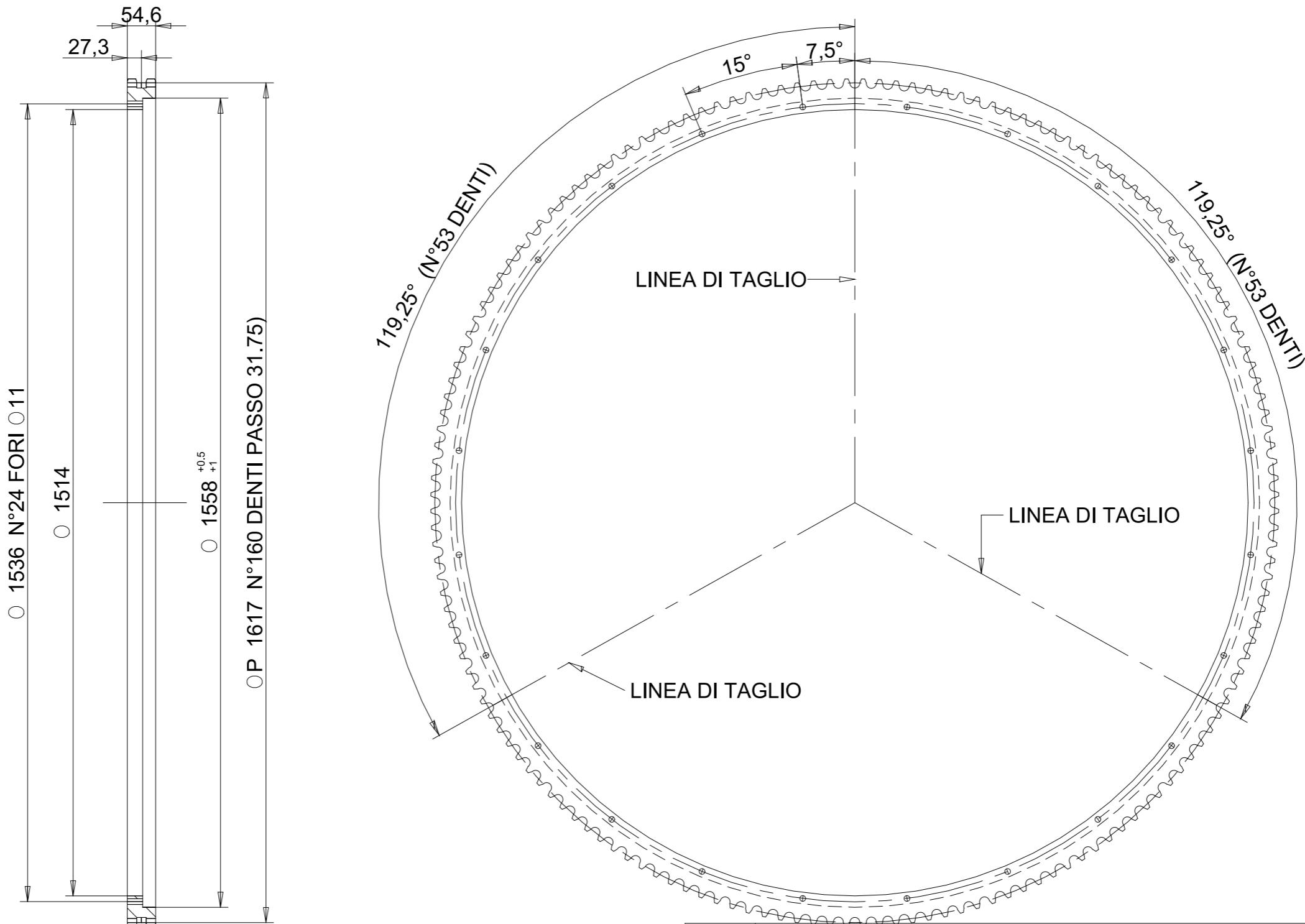


SMUSSARE 1X45°

01	PIATTO 100X15		PTFE	L.100	01
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà
0	1st. ISSUE			Gallinella	19/05/09
REVISION Revisione	REVISION HISTORY Storia delle revisioni			DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					
 Desmet Ballestra s.p.a. MILANO - Italy desmet ballestra					DRAWING Nr. / Disegno Nr. SB-PRS-00---/16
					CUSTOMER Nr. / Nr. Cliente
JOB Commissa	1E35		SHEET Foglio		
PLANT Impianto			SCALA Scala	1:2	
TITLE Titolo	ROTARY MIXER D.1500 SCRAPER BLADE		ITEM Posizione		
			REFERENCE DWG. Riferimento dwg.	09002/79	
We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					

ART.39689





TAGLIARE IN 3 SETTORI DOVE INDICATO

ART.42305

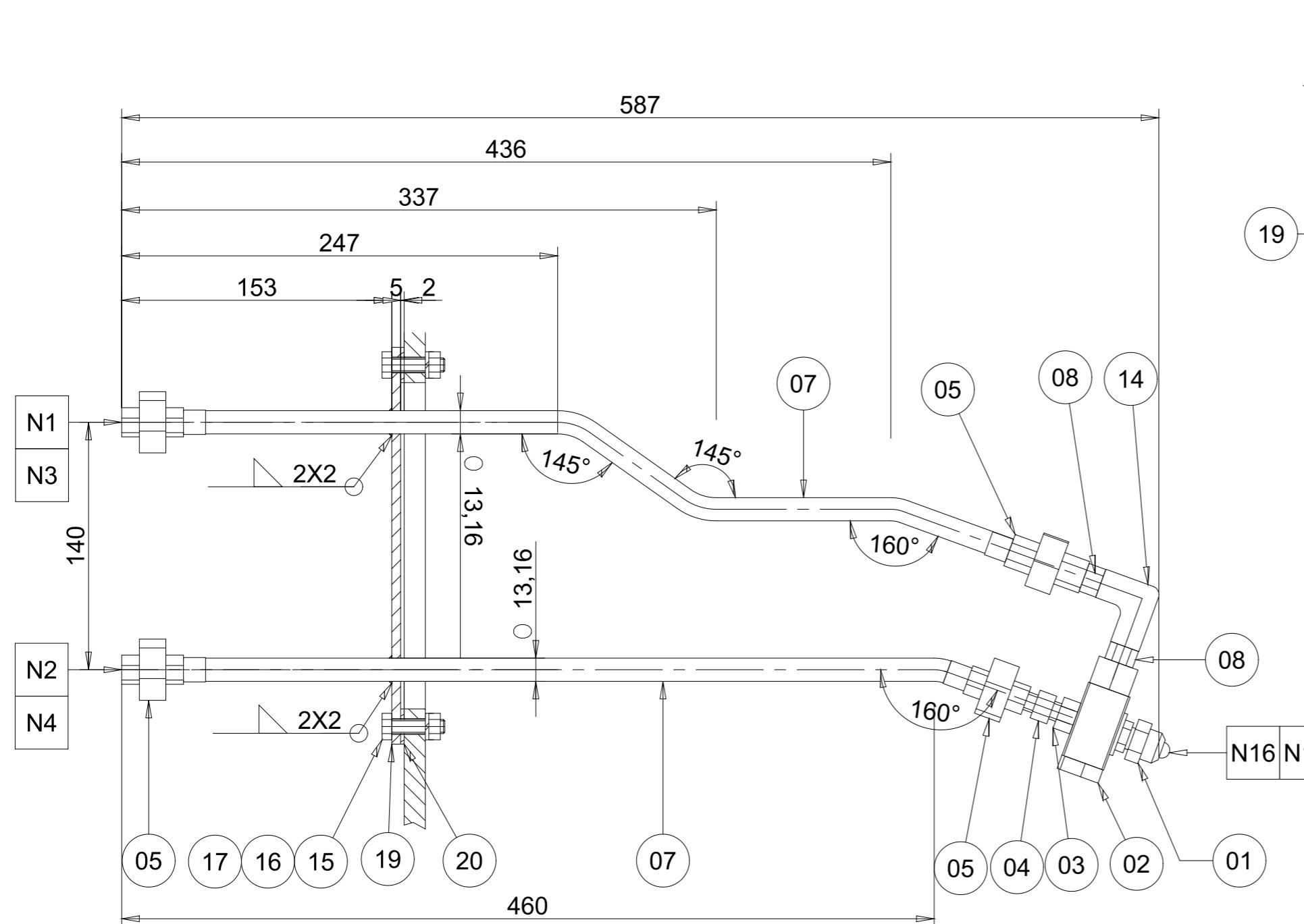
VERNICIARE RAL 7037

3.2

01	SQUARE BAR 60x60	-	C43	L.4945	
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Q.ty/Q.tà
N.° DATE/Data	REVISIONS/Modifiche		CHK'D/Firma	MAT.	

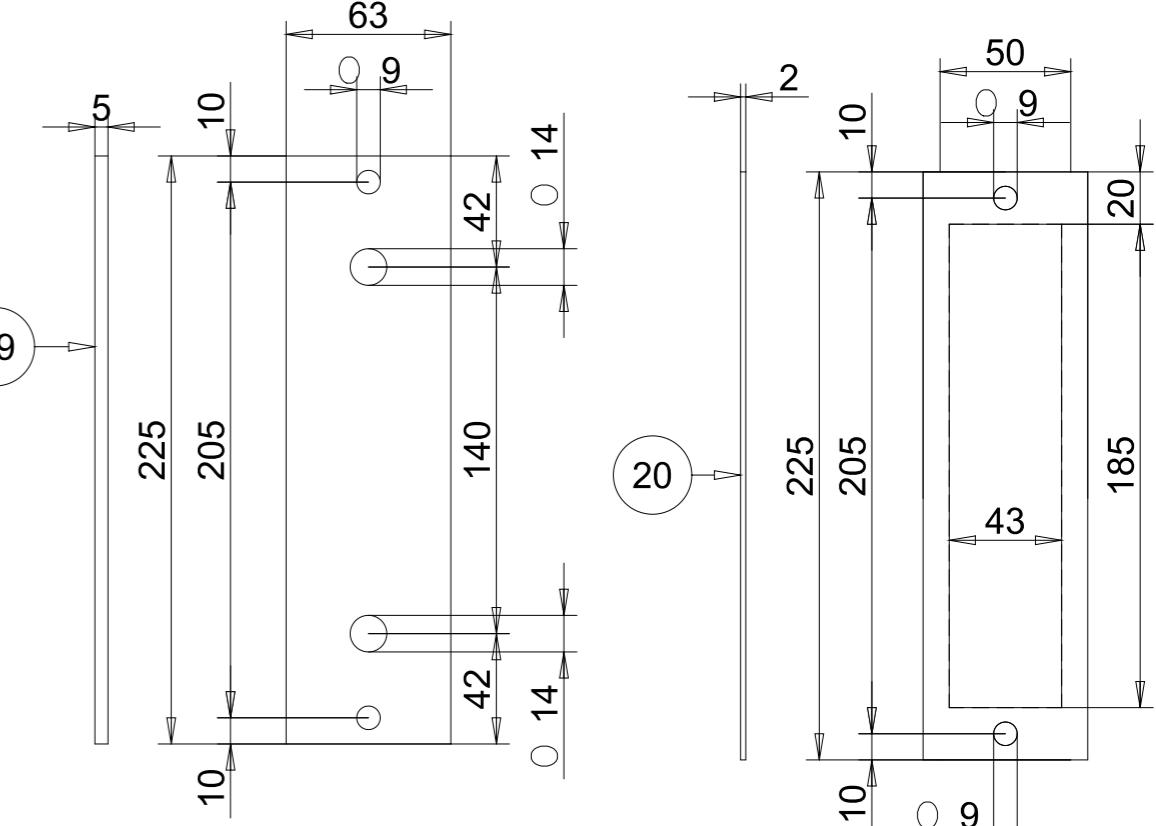
0	1st. ISSUE	Gallinella	03/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			
	Desmet Ballestra s.p.a. MILANO - Italy desmet ballestra	DRAWING Nr. / Disegno Nr. SB-PRS-00---/20	
JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE TOOTHED GEAR	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/5

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

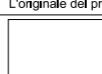


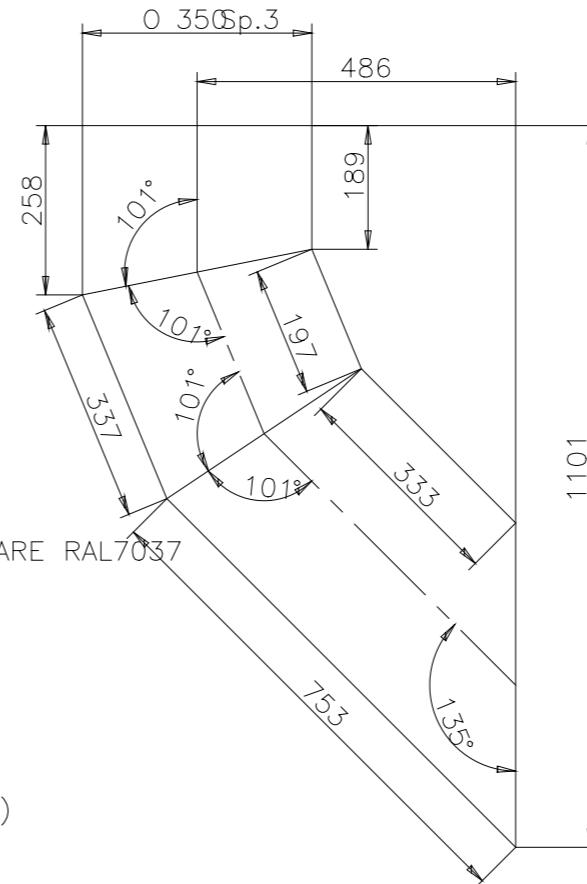
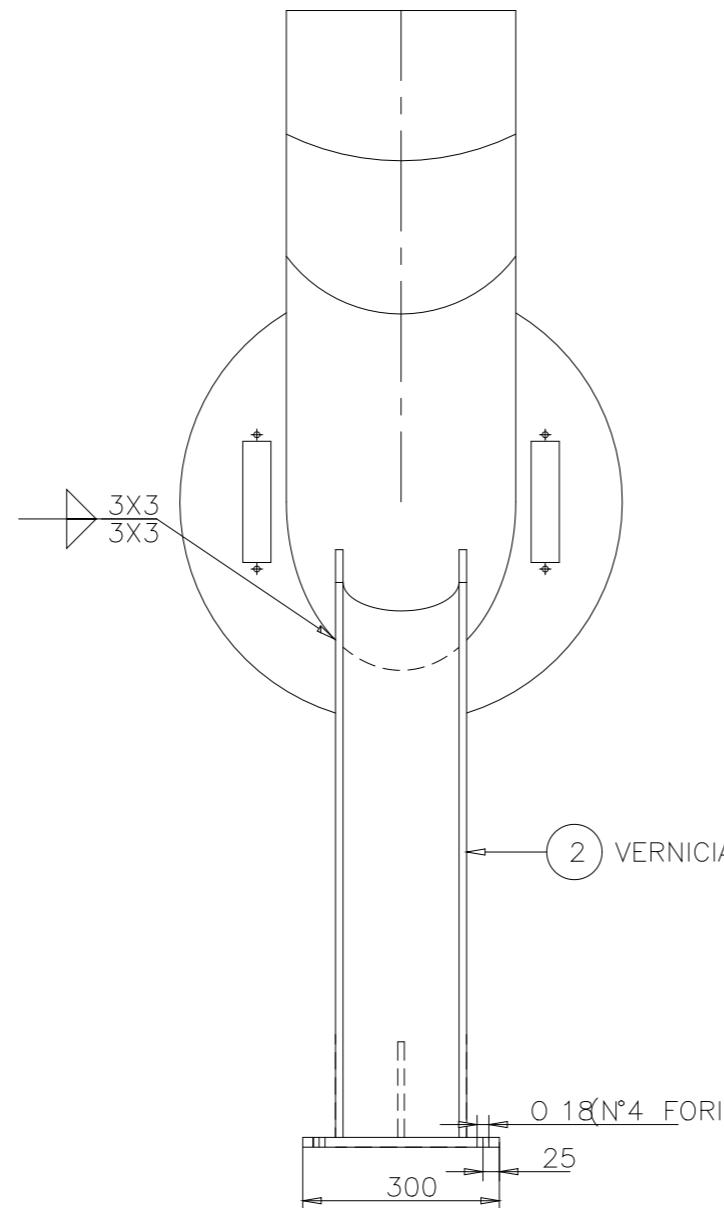
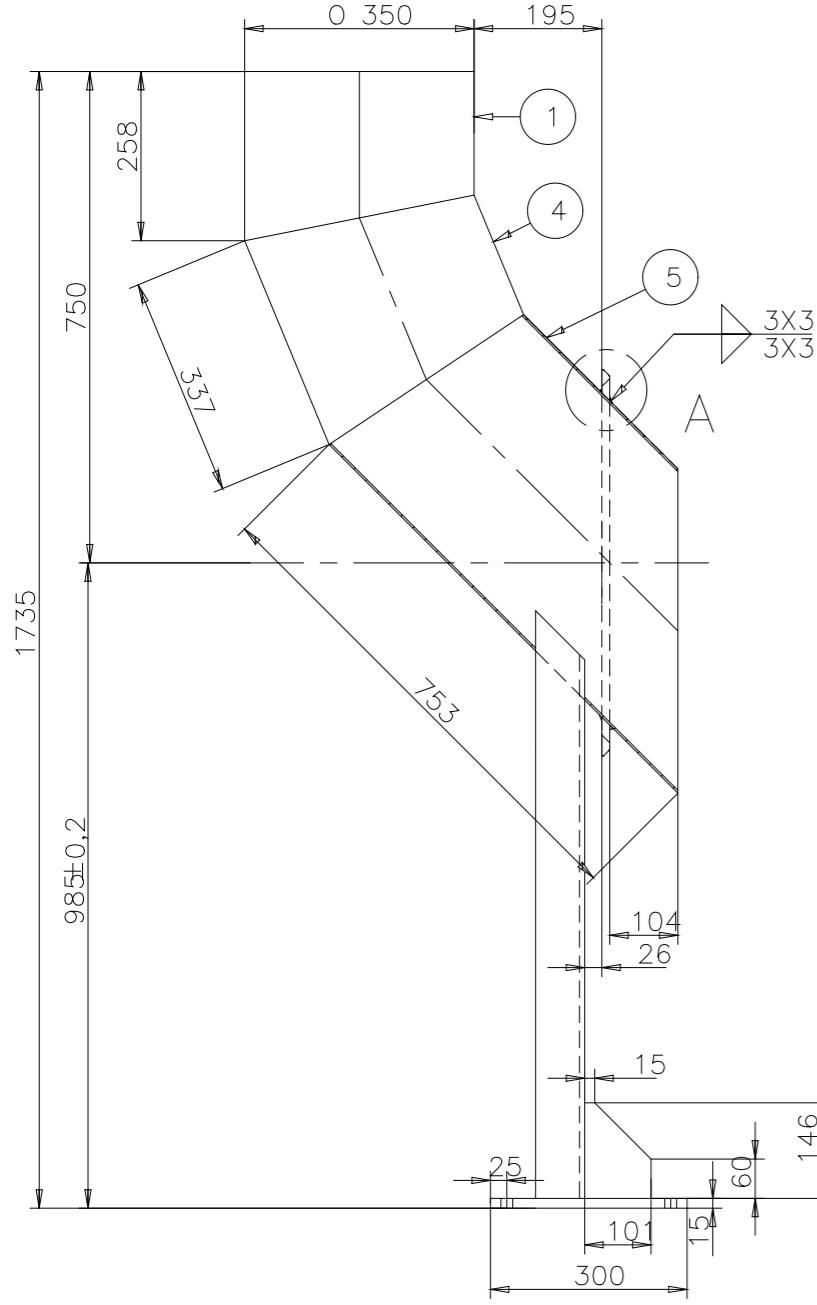
REALIZZARE N°2 PEZZI IDENTICI

N1	6 GELLO PROFUMO	ELPIS	1/4"	Z12				
N1	5 GELLO PROFUMO	ELPIS	1/4"	Z12				
N4	ENTRATA PROFUMO	JM0°F	BSPT					
N3	ENTRATA ARIA	1/4°F	BSPT					
N2	ENTRATA PROFUMO	JM4°F	BSPT					
N1	ENTRATA ARIA	1/4°F	BSPT					
POS	SERVICE Servizio	ND dn	OD. Dia est	TCK. Spess.	RATING Serie	TYPE Tipo	FACING Faccia	SPEC Tab
		NOZZLE	Bocchello		FLANGE		Flangia	

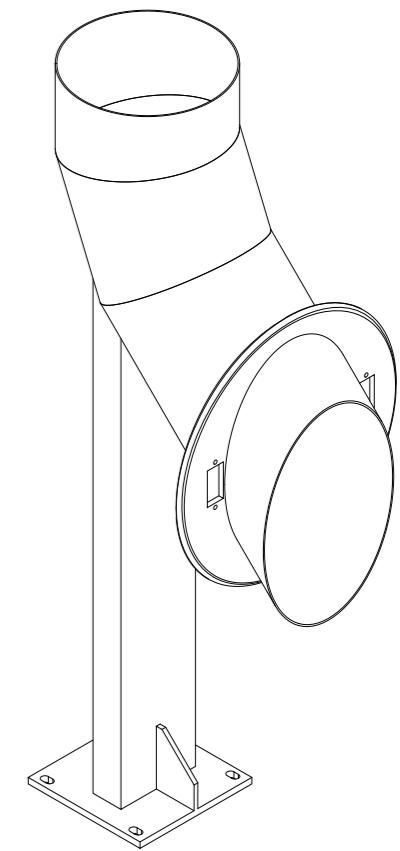


20	LASTRA SP.2	-	NBR	50X125	02
19	PIATTO 50X5	05102	AISI 304	L.125	02
17	ROSETTA	3319	A2	UNI1751 D.8,4	08
16	DADO	23577	A4	UNI5588 M8	08
15	VITE	4518	A4	UNI 5739 M8x30	08
14	GOMITO	42672	AISI 316	GOF1/4SS	02
08	NIPPLO	42671	AISI 304	NES1/4SS	04
07	PIPE 1/4" SCH.40S	00304	AISI 304	L.450	04
05	BOCCHETTONE 3PZ	42670	AISI 316	GFF1/4SS	06
04	CHECK VALVE ELPIS	39467	AISI 304	1/4BB0.37SS	02
03	ADATTATORE ELPIS	39466	AISI 304	RMF 1/4FX3/8UNF	02
02	TAPPO	42669	AISI 316	TEM1/4SS	02
01	UGELLO ELPIS	39466	AISI 304	1/4Z12SS	02
POS.	PART,\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity\Q.tà

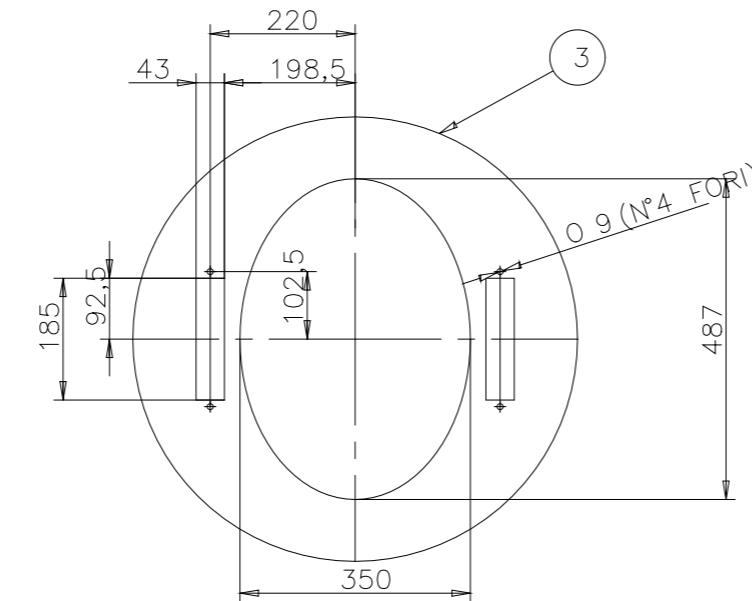
0	1st. ISSUE		Gallinella	03/03/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni		DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.				
 <p>Desmet Ballestra s.p.a. MILANO - Italy <i>desmet ballestra</i></p>			DRAWING Nr. / Disegno Nr. SB-PRS-00---/21	
			CUSTOMER Nr. / Nr. Cliente	
JOB Commissa	1E35		SHEET Foglio	
PLANT Impianto			SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE NOZZLES		ITEM Posizione	
			REFERENCE DWG. Riferimenti dwg.	09024/24
We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.				



DETTAGLIO A



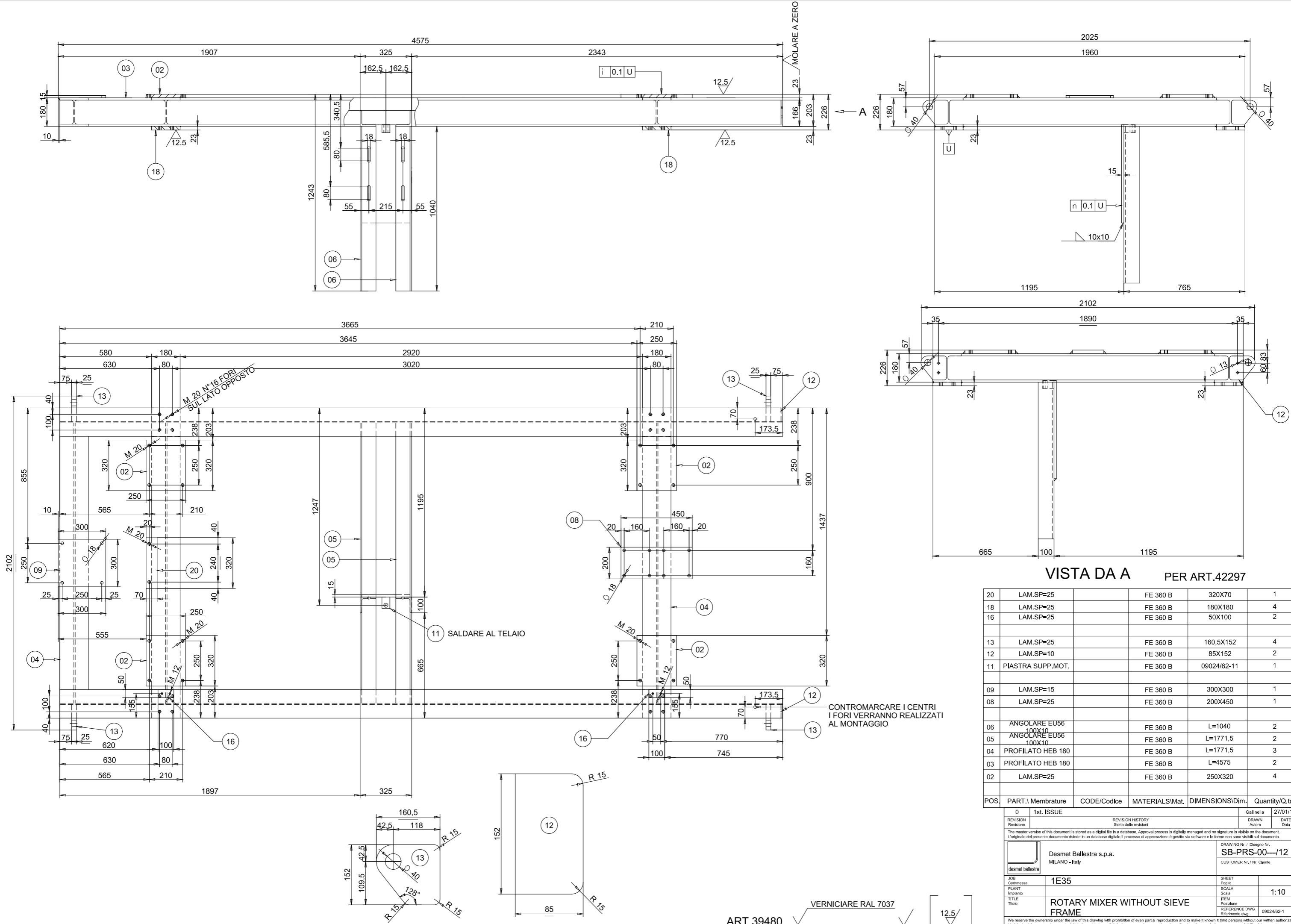
ART.42.

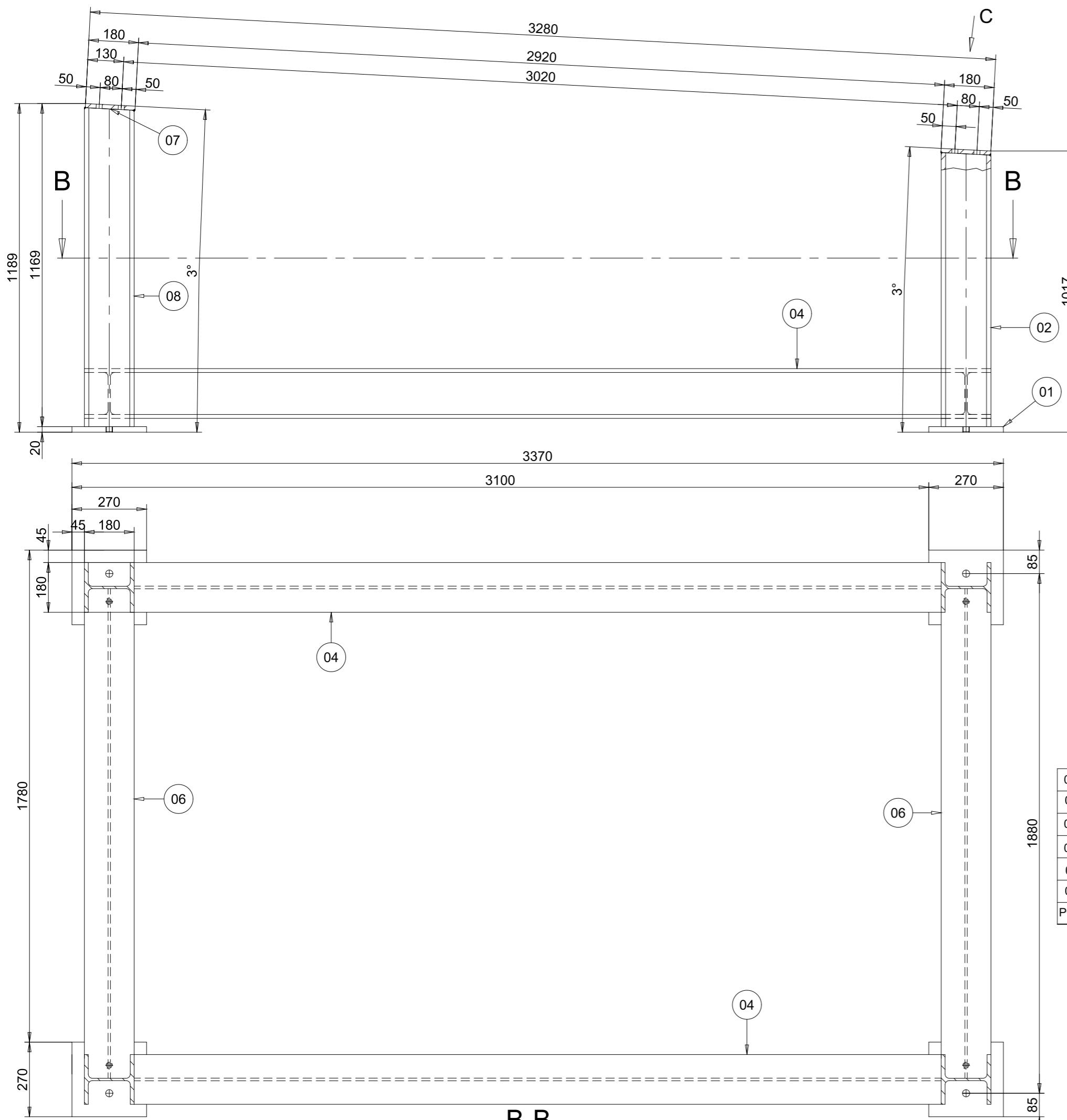


MATERIALS / DIMENSIONS / QANTITY				
05	LAMIERA Sp.38285	AISI 304	1200X7531	
04	LAMIERA Sp.38285	AISI 304	1200X3371	
03	LAMIERA Sp.38561	AISI 304	D.590 1	
02	SOSTEGNO BOCCH. FE 360B		09024/431-2	
01	LAMIERA Sp.38285	AISI 304	1200x2581	

0 1st. ISSUE		Gallinella	04/12/09
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			
	Desmet Ballestra s.p.a. MILANO - Italy	DRAWING Nr. / Disegno Nr. SB-PRS-00---/13	CUSTOMER Nr. / Nr. Cliente
JOB Comessa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE CHARGE HOOD		
REFERENCE DWG. Riferimento dwg.	09024/43G		

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

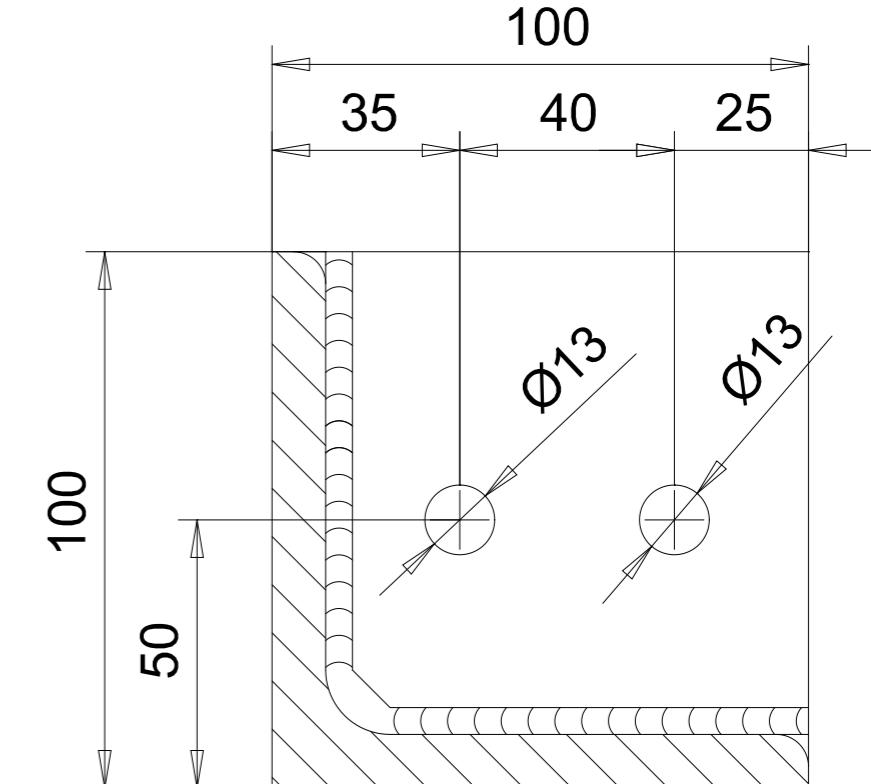
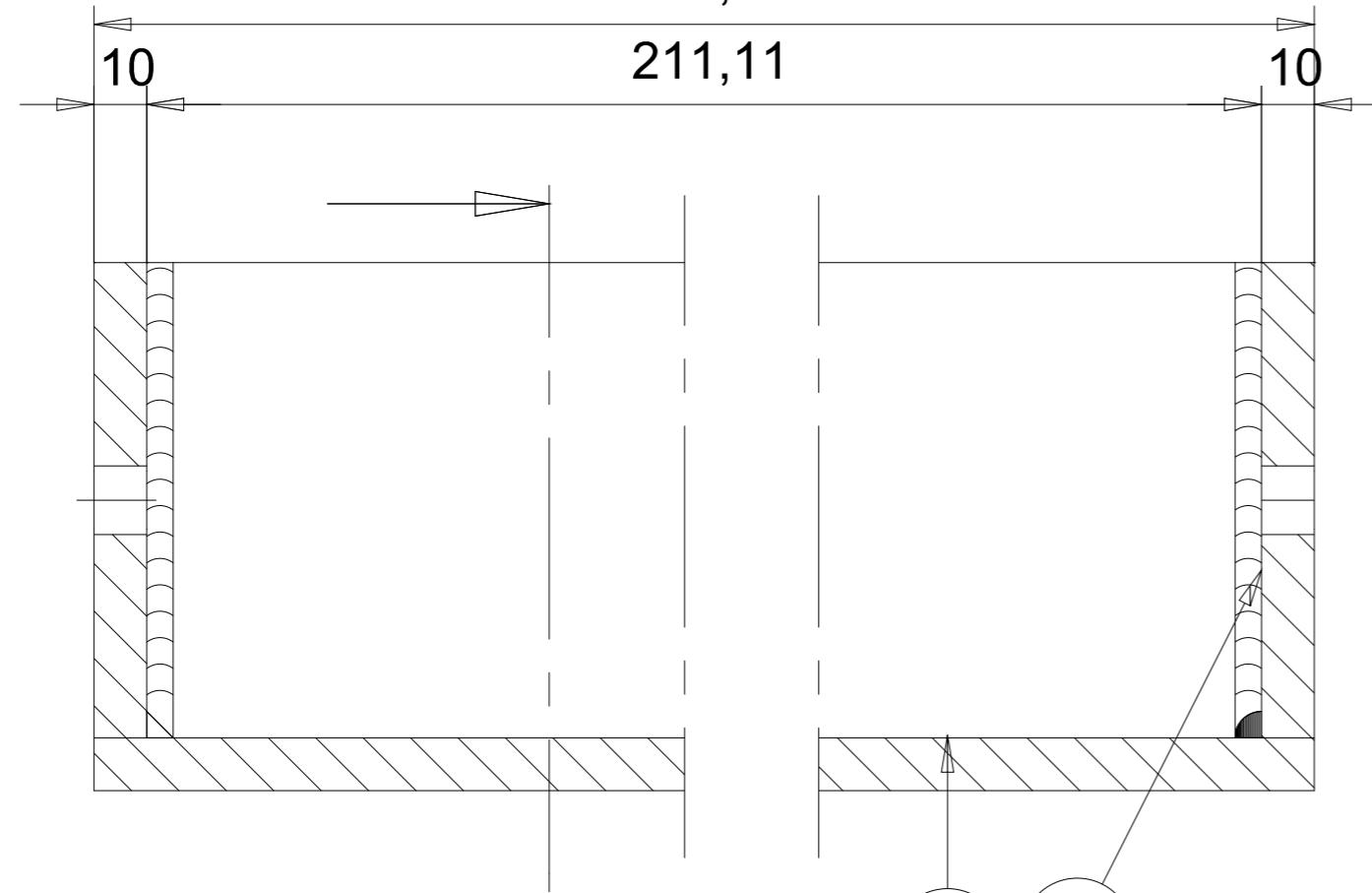




POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà
08	PROFILATO HEB 180		FE 360 B	L=1154	2
07	LAM.SP=15		FE 360 B	180X180	4
06	PROFILATO HEB 180		FE 360 B	L=1771,5	2
04	PROFILATO HEB 180		FE 360 B	L=2920	2
02	PROFILATO HEB 180		FE 360 B	L=992	2
01	LAM.SP=20		FE 360 B	270X270	4

0	1st. ISSUE	Gallinella	27/01/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			
Desmet Ballestra s.p.a. MILANO - Italy			
JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE BODY	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/62-2

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



PER ART.42297

VERNICIARE RAL7037

02	LAMIERA SP.10	-	FE 360	80X80	02
01	ANGOLARE EU56 100X10	-	FE 360	L=662	01
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà

0	1st. ISSUE	Gallinella	01/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



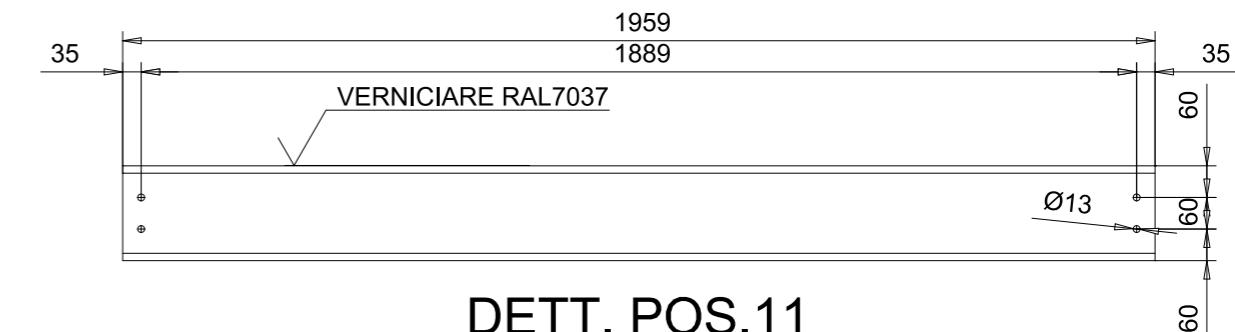
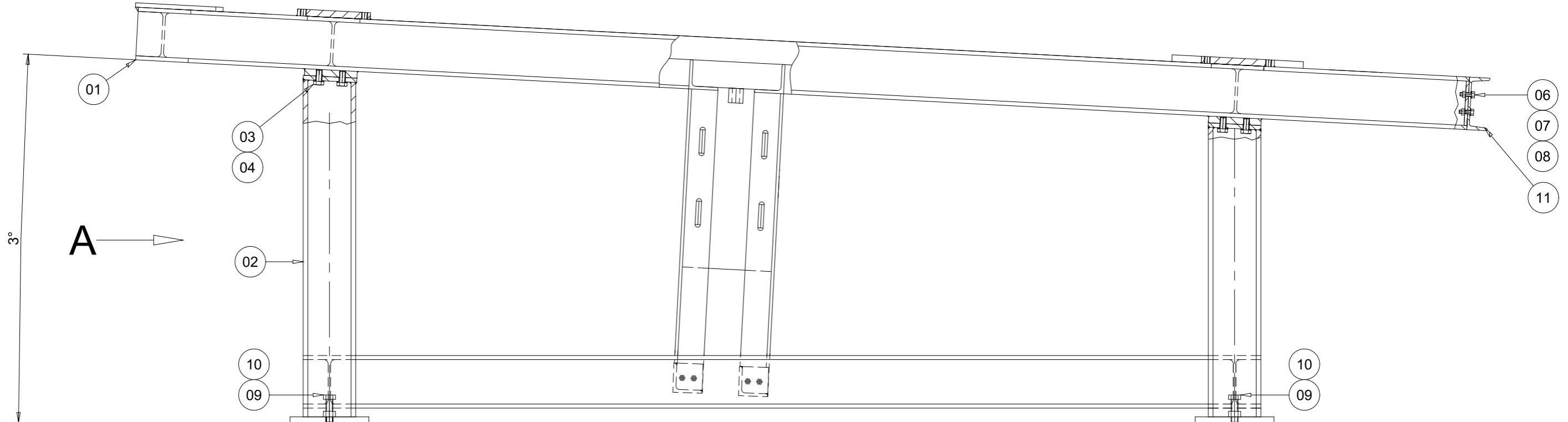
Desmet Ballestra s.p.a.
MILANO - Italy

DRAWING Nr. / Disegno Nr.
SB-PRS-00---/10

CUSTOMER Nr. / Nr. Cliente

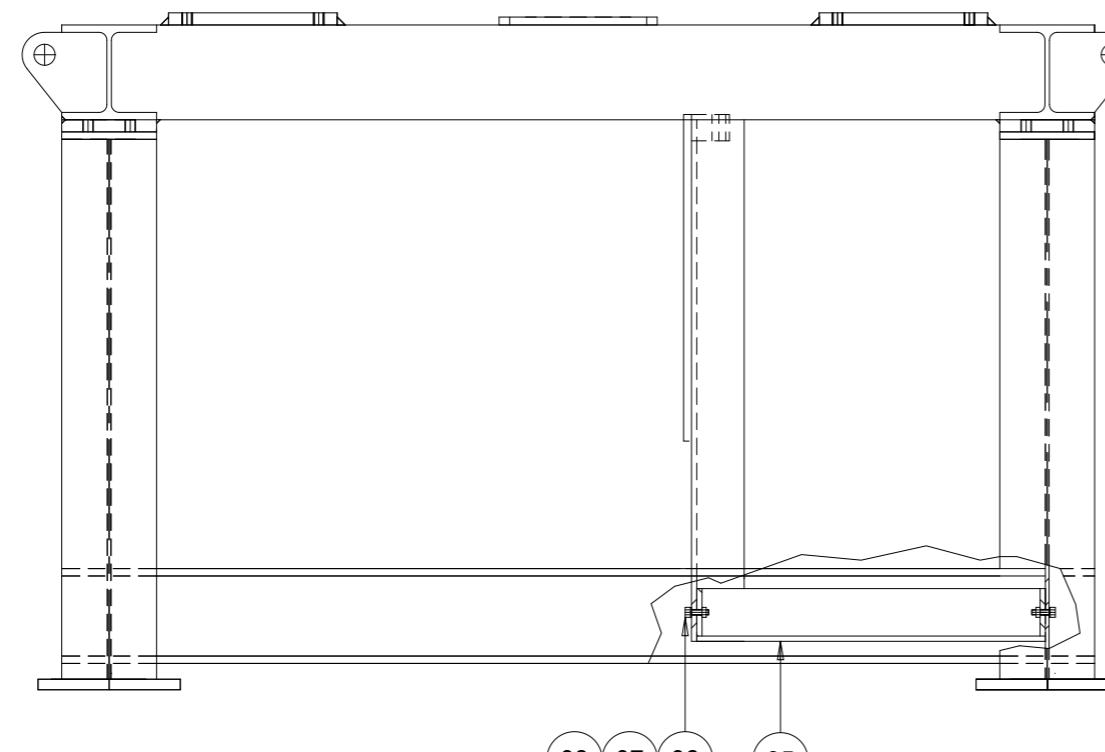
JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE FRAME	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/62-5

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



DETT. POS.11

ART.42297

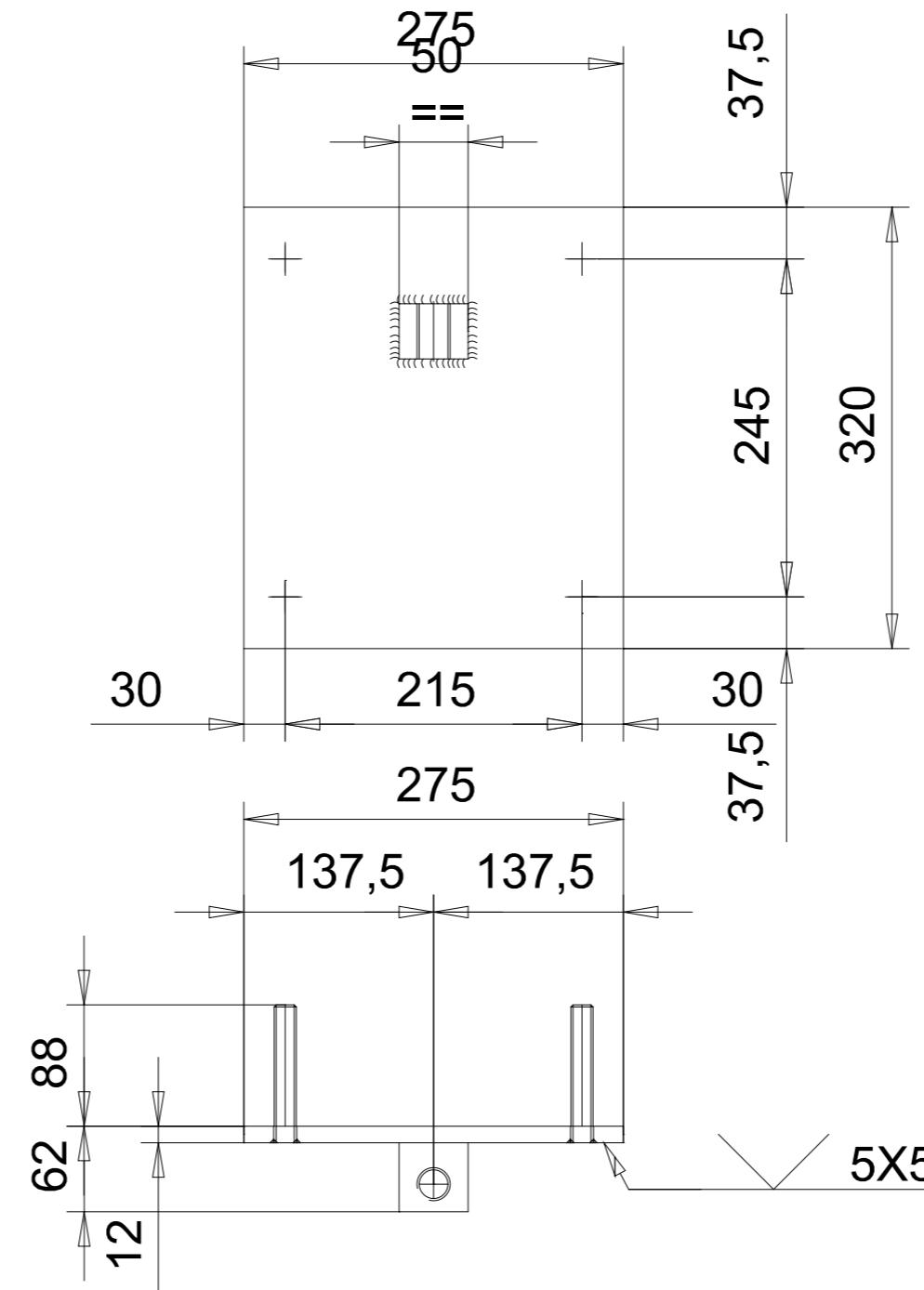
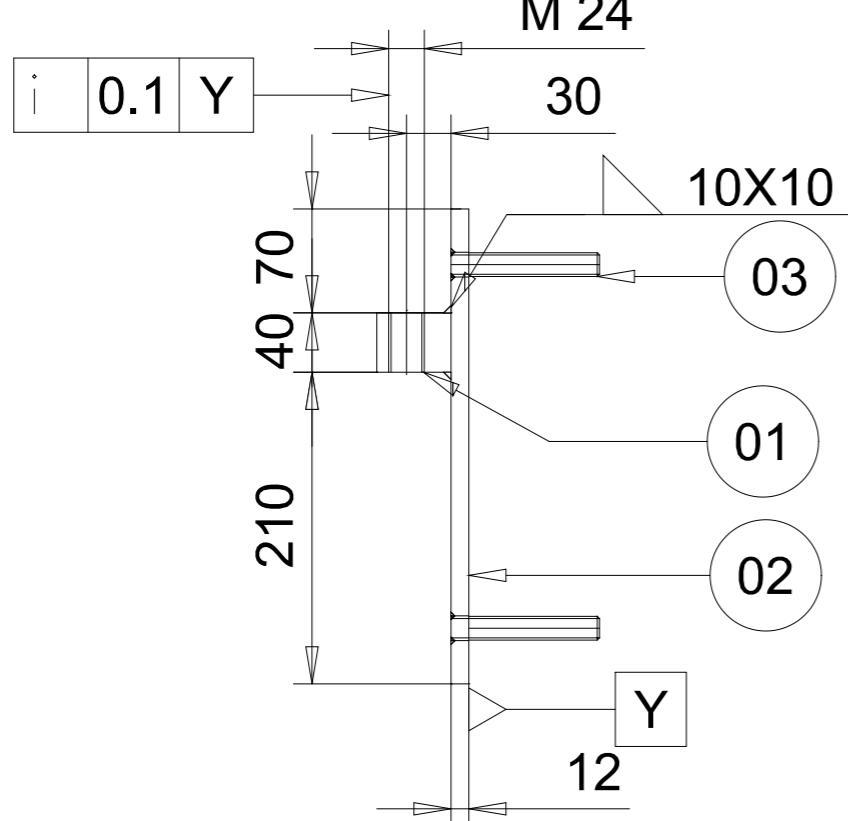


VISTA DA A

11	PROFILATO	UPN 180	FE 360 B	L=1959	1
10	DADO UNI 5588		8.G	M 24	4
09	VITE TE UNI 5739		8.8	M24X80	4
08	ROSETTA UNI 1751		8.G	D.13	8
07	DADO UNI 5588		8.G	M 12	8
06	VITE TE UNI 5739		8.8	M12X40	8
05	RINFORZO		FE 360B	09024/62-5	2
04	ROSETTA UNI 1751		8.8	D.21	16
03	VITE TE UNI 5739		8.8	M20X40	16
02	TELAIO INFERIORE		FE 360B	09024/62-2	1
01	TELAIO SUPERIORE		FE 360B	09024/62-1	1
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Quantity/Q.tà

0	1st. ISSUE	Gallinella	01/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.			
DRAWING Nr. / Disegno Nr. SB-PRS-00---/7			
desmet ballestra	Desmet Ballestra s.p.a. MILANO - Italy	CUSTOMER Nr. / Nr. Cliente	
JOB Comessa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE FRAME	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/62G

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



ART.42313

VERNICIARE RAL7037

03	TIRANTE M16X100	-	8.8	M16X100	4
02	LAMIERA Sp.12	-	FE 360B	275X320	1
01	QUADRO 50X50	-	FE 360B	L=50	1

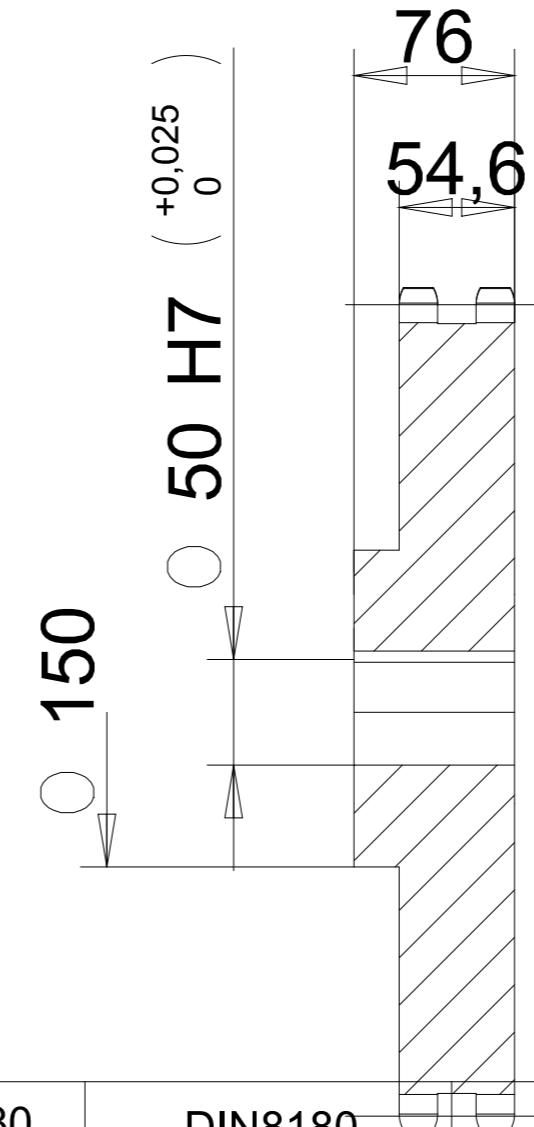
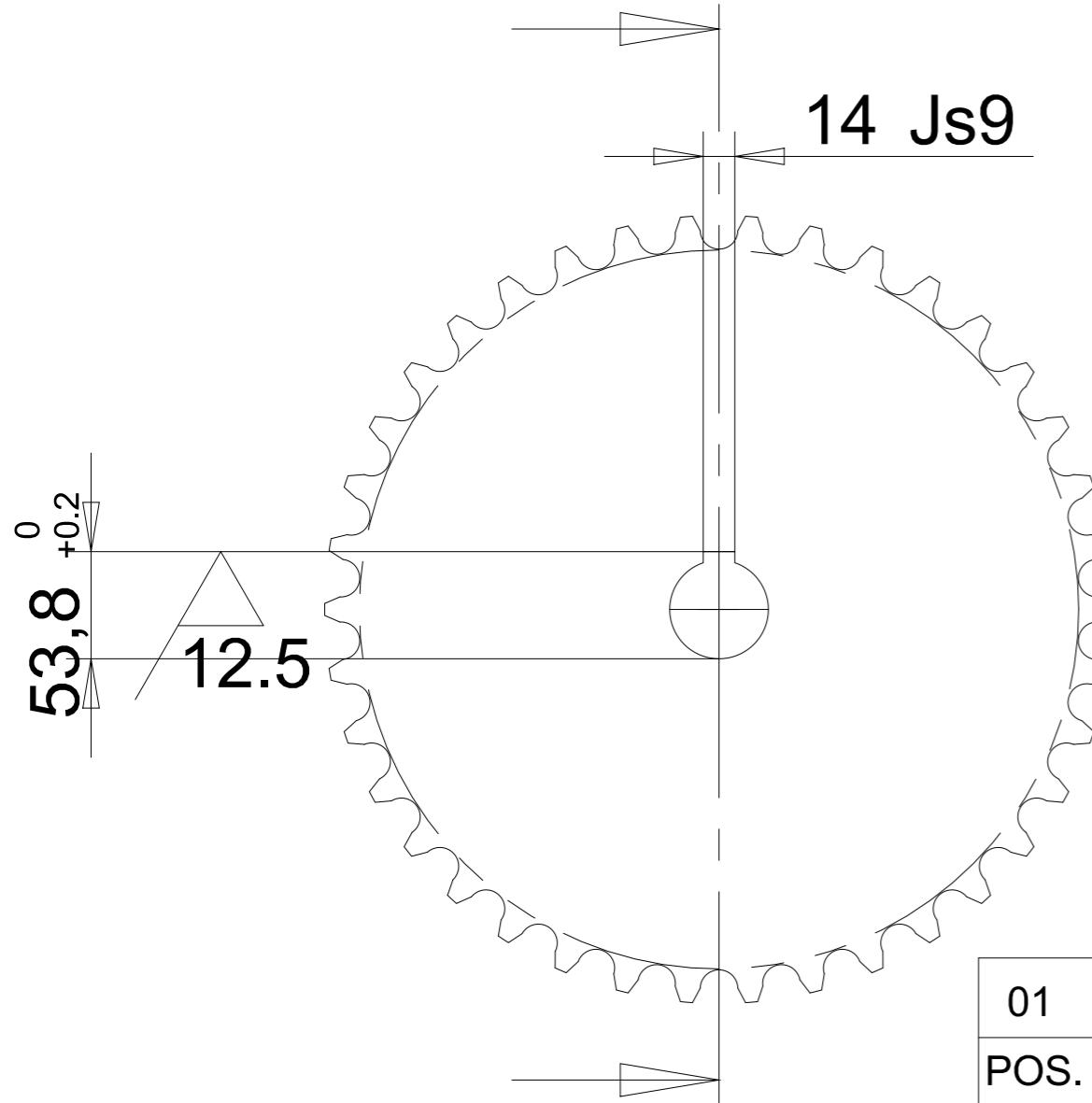
0	1st. ISSUE	Gallinella	04/02/10
REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data

The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.

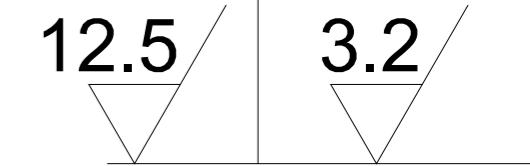
	Desmet Ballestra s.p.a. MILANO - Italy desmet ballestra	DRAWING Nr. / Disegno Nr. SB-PRS-00---/6
CUSTOMER Nr. / Nr. Cliente		

JOB Commissa	1E35	SHEET Foglio	
PLANT Impianto		SCALA Scala	1:10
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE GEAR REDUCER SUPPORT	ITEM Posizione	
		REFERENCE DWG. Riferimento dwg.	09024/67

We reserve the ownership under the law of this drawing with prohibition of even partial reproduction and to make it known to third persons without our written authorization.
L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.



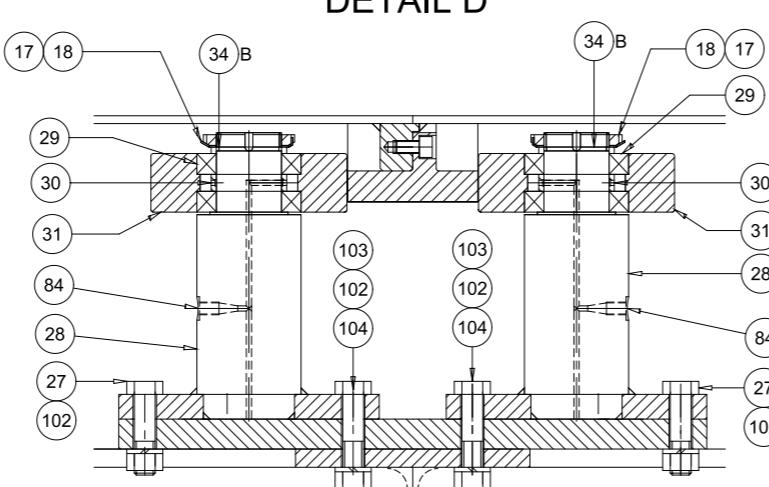
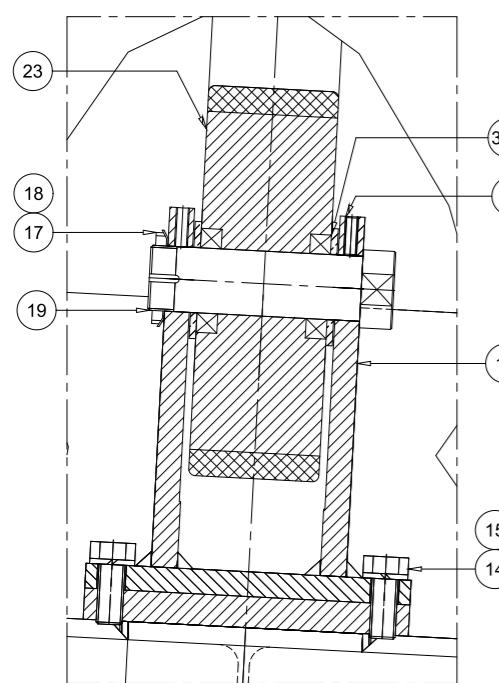
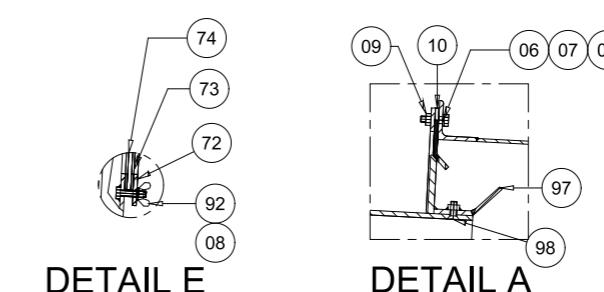
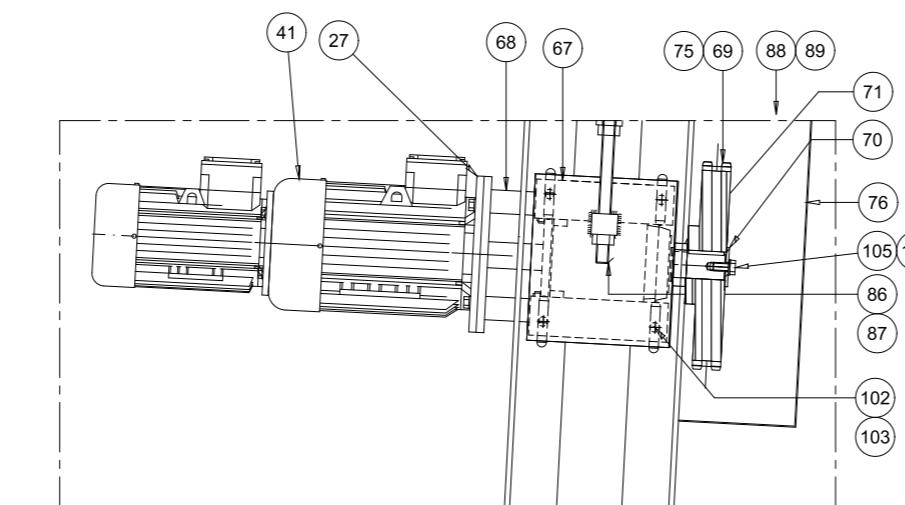
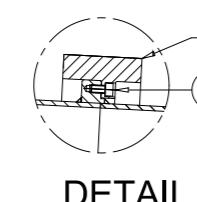
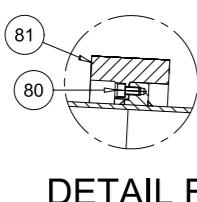
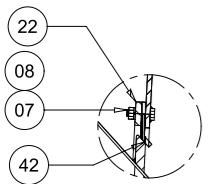
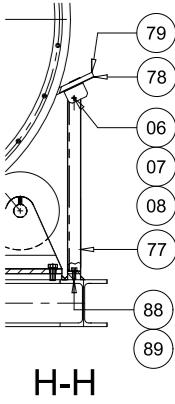
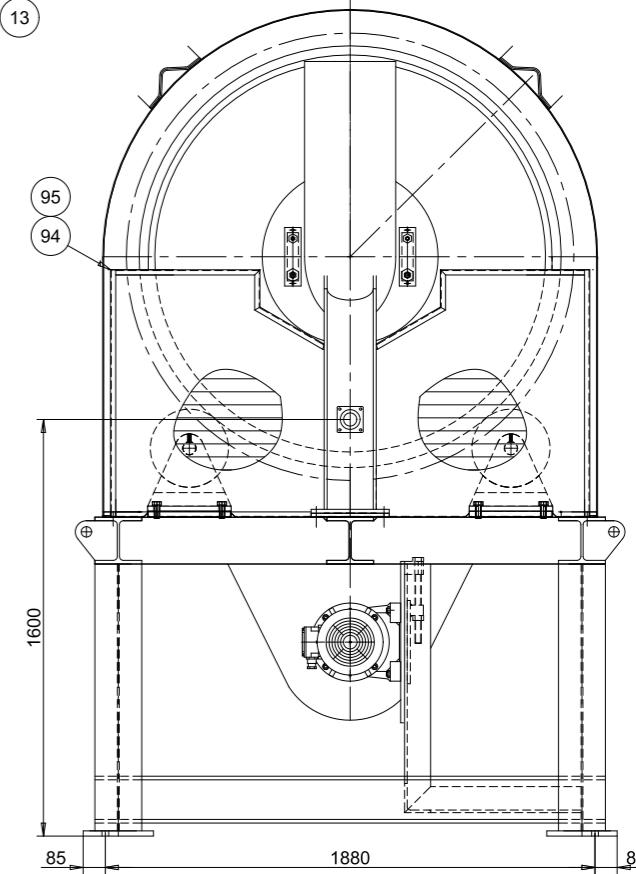
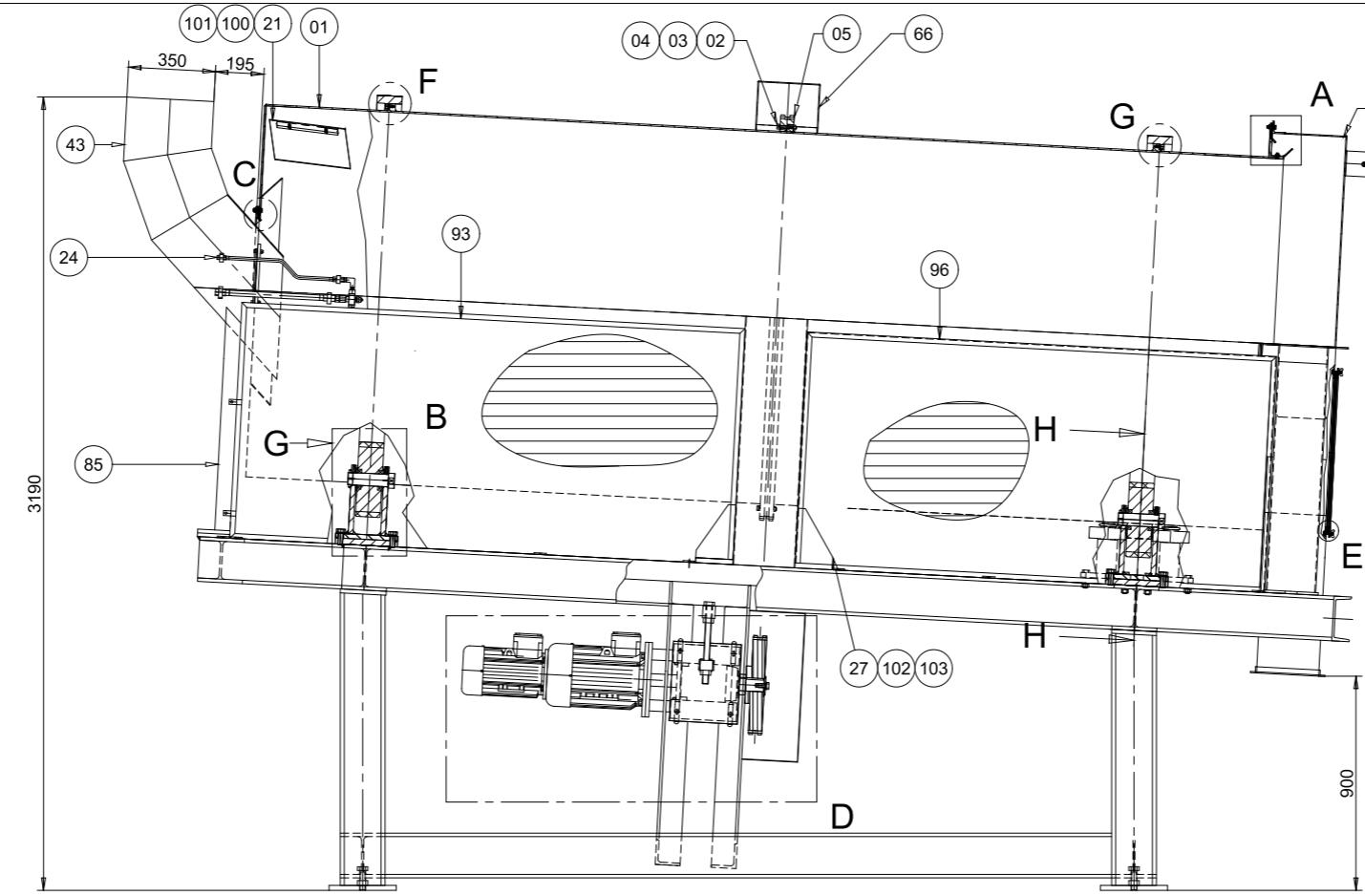
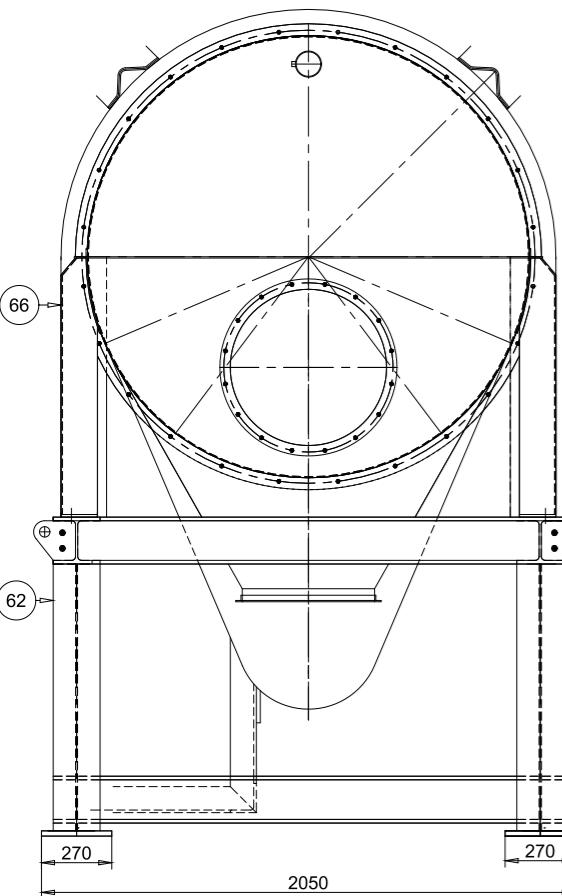
ART.42314



CATENA DIN 8180/8187-8188
Z=38
PASSO=1 1/4"(31.75)

VERNICIARE RAL7037

01	PIGNONE DIN8180	DIN8180	FE 50	Z=38	1
POS.	PART.\ Membrature	CODE/Codice	MATERIALS\Mat.	DIMENSIONS\Dim.	Q.ty
1	TONGUE DIMENSION MODIFIED				
0	1st. ISSUE				
REVISION Revisione	REVISION HISTORY Storia delle revisioni		DRAWN Autore	DATE Data	
The master version of this document is stored as a digital file in a database. Approval process is digitally managed and no signature is visible on the document. L'originale del presente documento risiede in un database digitale. Il processo di approvazione è gestito via software e le forme non sono visibili sul documento.					
 desmet ballestra					DRAWING Nr. / Disegno Nr. SB-PRS-00---/5
					CUSTOMER Nr. / Nr. Cliente
JOB Commessa	1E35			SHEET Foglio	
PLANT Impianto				SCALA Scala	1:5
TITLE Titolo	ROTARY MIXER WITHOUT SIEVE PINION			ITEM Posizione	
				REFERENCE DWG. Riferimento dwg.	09024/69



POS.	DESCRIPTION	MATERIAL	DIMENSION/DRAWING	CODE	Q.TY	NOTES
1	CYLINDRICAL BODY	AISI 304	090201/12	42391	1	
2	NUT	8G	UNIS588 M10	5854	24	
3	SCREW	8G	UNIS739 M10X70	5668	24	
4	WASHER	A4	UNI175 D.10.4	4682	24	
5	TOOTHED GEAR	C43	2602110	42305	1	
6	SCREW	8G	UNIS739 M8X30	5899	50	
7	NUT	8G	UNIS588 M8	5825	44	
8	WASHER	A4	UNI175 D.8.4	4661	66	
9	FLANGE	FE 360	1126149	32988	1	
10	GASKET	NBR	1126179	32899	1	
11	EXTERNAL BODY	AISI 304	090241/3G	42307	1	
12	SCREW	8G	UNIS739 M20X50	5719	16	
13	WASHER	A4	UNI175 D.10.4	4685	1	
14	SCREW	8G	UNIS739 M20X50	5719	16	
15	WASHER	A4	UNI175 D.10.4	4685	1	
16	SUPPORT	FE 360	090202/16	39487	4	
17	PIN	C43	MSV100/100	5813	6	
18	WASHER	C43	D.50 MB1	7813	6	
19	PIN	C43	05010/19	34082	4	
20	SCREW	8G	UNIS923 M10X30	32956	8	
21	BLADE	AISI 304	1125920	32990	30	
22	FLANGE	AISI 304	090202/2	42309	1	
23	VEEL	FE 360	D.300X100X100X600	58176	4	
24	NOZZLES	AISI 304	09024/24	32984	1	
25	SCREW	8G	UNIS739 M10X65	5710	8	
26	SUPPORT	FE 360	090202/28	39488	2	
27	BEARING	C43	50/80/10 601/2RS1	32920	4	
28	SPACER	FE 360	05010/30	32915	2	
29	ROD	C40	09024/31	42312	2	
30	SCREW	FE 360	05010/34	34096	10	
31	ROTATOR	FE 360	09024/34	42313	1	
32	SUPPORT	FE 360	09024/40	42314	1	AVO
33	GEAR REDUCER	C43	090204/40	42314	1	STOBER
34	PINION	C43	09024/49	42314	1	
35	SPACER	FE 360	04025/51A	31772	1	
36	FLANGE	AISI 304	05010/72	32947	1	
37	GASKET	NBR	1125921	32948	1	
38	SIGHT GLASS	POLYCARBONATE	D.640 THL5	32904	1	
39	COVER	C43	DN8167 150X150 DOUBLE	32904	1	
40	CARTER	FE 360	05010/76	32949	2	
41	ELECTRIC MOTOR	NBR	09010/42	32922	1	
42	GASKET	AISI 304	09024/43G	42311	1	
43	CHARGE HOOD	AISI 304	09024/43G	42311	1	
44	FRAME	FE 360	09024/2G	42307	1	
45	PROTECTION	FE 360	05010/60	32942	1	
46	SUPPORT	FE 360	09024/40	42313	1	
47	PINION	C43	090204/40	42314	1	
48	SPACER	FE 360	04025/51A	31772	1	
49	FLANGE	AISI 304	05010/72	32947	1	
50	GASKET	NBR	1125921	32948	1	
51	SIGHT GLASS	POLYCARBONATE	D.640 THL5	32904	1	
52	COVER	C43	DN8167 150X150 DOUBLE	32904	1	
53	CARTER	FE 360	05010/77	32949	2	
54	SUPPORT	FE 360	05010/78	32951	2	
55	CLEANER	PTEE	100X150	32951	2	
56	SCREW	8G	UNIS931 M10X20	5770	48	
57	ROLLER TRACK	C40	090202/81	39475	2	
58	SAFETY CLOCK	FE 360	090202/83	39475	2	
59	GREASER	C43	090202/40	42313	1	
60	EMERGENCY STOP	FE 360	090202/40	42313	1	
61	NUT	8G	UNIS588 M24	5835	2	
62	STUD BOLT	UN M24X300	32996	1		
63	WASHER	A4	UNI175 D.15	5830	4	
64	NUT	8G	UNIS588 M12	5830	10	
65	PROTECTION	FE 360	05010/93	34372	1	
66	SCREW	8G	UNI175 D.15	5837	1	
67	PROTECTION	FE 360	05010/94	34374	1	
68	SCREW	8G	UNI175 D.15	58375	1	
69	WASHER	A4	UNI175 D.15	58375	1	
70	NUT	8G	UNIS588 M8	5831	16	
71	PROTECTION	FE 360	05010/93	34372	1	
72	SCREW	8G	UNI175 D.15	5837	1	
73	WASHER	A4	UNI175 D.15	5837	1	
74	NUT	8G	UNI175 D.15	5837	1	
75	SCREW	8G	UNI175 D.15	5837	1	
76	WASHER	A4	UNI175 D.15	5837	1	
77	NUT	8G	UNI175 D.15	5837	1	
78	SCREW	8G	UNI175 D.15	5837	1	
79	WASHER	A4	UNI175 D.15	5837	1	
80	NUT	8G	UNI175 D.15	5837	1	
81	SCREW	8G	UNI175 D.15	5837	1	
82	WASHER	A4	UNI175 D.15	5837	1	
83	NUT	8G	UNI175 D.15	5837	1	
84	SCREW	8G	UNI175 D.15	5837	1	
85	WASHER	A4	UNI175 D.15	5837	1	
86	NUT	8G	UNI175 D.15	5837	1	
87	SCREW	8G	UNI175 D.15	5837	1	
88	WASHER	A4	UNI175 D.15	5837	1	
89	NUT	8G	UNI175 D.15	5837	1	
90	SCREW	8G	UNI175 D.15	5837	1	
91	WASHER	A4	UNI175 D.15	5837	1	
92	NUT	8G	UNI175 D.15	5837	1	
93	SCREW	8G	UNI175 D.15	5837	1	
94	WASHER	A4	UNI175 D.15	5837	1	
95	NUT	8G	UNI175 D.15	5837	1	
96	SCREW	8G	UNI175 D.15	5837	1	
97	WASHER	A4	UNI175 D.15	5837	1	
98	NUT	8G	UNI175 D.15	5837	1	
99	SCREW	8G	UNI175 D.15	5837	1	
100	WASHER	A4	UNI175 D.15	5837	1	
101	NUT	8G	UNI175 D.15	5837	1	
102	SCREW	8G	UNI175 D.15	5837	1	
103	WASHER	A4	UNI175 D.15	5837	1	
104	NUT	8G	UNI175 D.15	5837	1	
105	SCREW	8G	UNI175 D.15	5837	1	
106	WASHER	A4	UNI175 D.15	5837	1	
107	NUT	8G	UNI175 D.15	5837	1	
108	SCREW	8G	UNI175 D.15	5837	1	
109	WASHER	A4	UNI175 D.15	5837	1	
110	NUT	8G	UNI175 D.15	5837	1	
111</						



3V COGEIM

P.O.BOX 219 VIA FRIULI, 19 24044 DALMINE (BG) ITALY
TEL.+39-035-4165.607-608-609-610 FAX +39-035-56.56.56

FATR No.

Page 1

L36

of

FACTORY ACCEPTANCE TEST REPORT

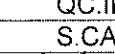
3V COGEIM JOB No. L36

UNIT TYPE:	MISCELATORE ROTANTE CON SETACCIO D.1500
CLIENT:	BALLESTRA

SUMMARY OF TESTS AND TEST RESULTS:

LOCATION:

DALMINE

3V COGEIM S.r.l.	CLIENT INSPECTOR
Position QC.INSPECTOR	Position
Name S.CAPELLI	Name
Signature 	Signature
Date 14/09/10	Date

FACTORY ACCEPTANCE TEST REPORT:

MT- 1

FATR No.	DATE	Page
L36	13/09/10	of

VISUAL & DIMENSIONAL INSPECTION

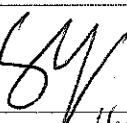
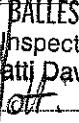
Reference Drawing(s): 09024

1. Inspect the unit visually.
2. Verify the conditions and assembling of all the components and instruments .
3. Check internal surface finish.
4. Check external surface finish.
5. With the drawing check the dimension of unit.

	Accepted	Rejected	See Note No.	Sign.
1. Presence of all the components listed on the drawing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
2. Correct assembly of components.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Conformity of all the surface (eg. free from harmful defect, right roughness, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4. Conformity of painting.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
5. Dimensional Check	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
6.	<input type="checkbox"/>	<input type="checkbox"/>		

LOCATION:

DALMINE

3V COGEIM S.r.l.		CLIENT INSPECTOR
Position	QC.INSPECTOR	Company
Name	S.CAPELLI	Name
Signature		Signature  Inspector Gatti Davide
Date	14/09/10	Date 

FACTORY ACCEPTANCE TEST REPORT:

MT-2

FATR No.	DATE	Page
L36	13/09/10	of

RUNNING TEST

Reference Drawing(s): 09024

1. Start agitator In Orizontal Position.
2. Check agitator rpm : Required speed : 24 rpm max
3. Check motor absorbed current (A) : The current absorbed by the electric motor agitator is not higher than 80% of the nominal current.

Electric motor agitator nominal current: (380V) 15 A acceptable value : < 12 A

The operations run smoothly without bumps, appreciable variation in speed or noises that may identify any mechanical problem..

		Acc.	Rej.	Note No.	Sign.
1. MOTOR ABSORBED CURRENT:	9,2 :A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SPUNTO 60A	
2. MAX ROTATION SPEED:	15 :RPM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SEUCA INVERTER	

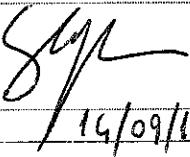
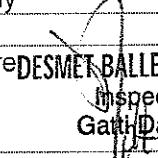
TEST RESULT:

- Accepted
 Rejected
 Some remarks, see enclosed sheets

Note N°	Sign.

LOCATION:

DALMINE

3V COGEIM S.r.l.		CLIENT INSPECTOR
Position	QC.INSPECTOR	Company
Name	S.CAPELLI	Name
Signature		Signature  DESMET BALLESTRA S.p.A. Inspector Gatti Davide
Date	14/09/10	Date



MACCHINE E IMPIANTI CHIMICO-FARMACEUTICI

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Rotary Mixer Diameter 1500 mm



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pag.: 1 of 1

Sect.: Preface

Revision No:

Date: 31/08/01

INDEX

INDEX

SECTION N°	TITLE	REV	DATE
Preface	TITLE PAGE	0	31.08.01
Preface	INDEX	0	31.08.01
1	IDENTIFICATION DATA	0	31.08.01
2	MANUAL USE AND PRESERVATION	0	31.08.01
3	ASSISTANCE INFORMATIONS	0	31.08.01
4	REMARKS AND RESIDUAL RISKS	0	31.08.01
5	TECHNICAL DESCRIPTION AND SAFETY MEASURES	0	31.08.01
6	MOVING AND STORING	0	31.08.01
7	INSTALLATION	0	31.08.01
8	PREPARATION TO START UP	0	31.08.01
9	MAINTENANCE, DISMANTLING AND REASSEMBLY	0	31.08.01
10	DRAWINGS	0	31.08.01
11	ATTACHMENTS	0	31.08.01

Issued by: **Date:**

Engineering Manager

Approved: **Date:**

Quality Manager



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pag.: 1 of 1

Sect.: 1

Revision No:

Date: 31/08/01

IDENTIFICATION DATA

Section 1 IDENTIFICATION DATA

Manufacturer: 3V COGEIM srl

Customer: BALLESTRA Spa

Purchase Order Nr.: 290966 C1E35Z

Job Nr.: C 1E35

Item: 65MX1

Model: MIXER Diameter 1500 mm without sieve

Year of construction: 2009

Serial No: 1317



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pag.: 1 of 1

Sect.: 2

RevisionNo:

Date: 31/08/01

MANUAL USE AND PRESERVATION

Section 2 MANUAL USE AND PRESERVATION

- 2.1 The reading of this manual and all the maintenance operations performed on the machine are reserved to skilled personnel.
- 2.2 Always preserve this manual for future references. We recommend having it available for consultation from the authorised maintenance personnel.
- 2.3 In order to obtain other manual copies or updating, please contact MABO - Technical Dept. - fax nr. ++39 0523 983772. For further information always contact MABO.
- 2.4 MABO reserves the right to modify the machine type and its manual without updating the existing machines and manuals.



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pag.: 1 of 1

Sect.: 3

Revision No:

Date: 31/08/01

ASSISTANCE INFORMATIONS

Section 3 ASSISTANCE INFORMATIONS

For any need please contact Ballestra: Fax No. ++39 0258018449

E-mail: ballestra@ballestra.com

REMARKS AND RESIDUAL RISKS

Section 4 REMARKS AND RESIDUAL RISKS

Please refer to the relevant section of this manual for the specific safety instructions for each subject.

The specific safety instructions are marked by the following symbols:

D**Danger**

It means that if precautions are not taken, a danger can occur to the user's health and life .

C**Caution**

It means that if precautions are not taken, damages can occur to the machine or other goods.

This section has the purpose of reminding in general the risks deriving from the use of our machine.

4.1 Mechanical risks - Weight

D**Danger**

The machine weight is indicated on the assembly drawing and on the shipping documents.

D**Danger**

Always consider machine weight during machine unloading operations.

REMARKS AND RESIDUAL RISKS

C

Caution

Always consider the total weight of the machine including the complete filling with water or with the processed liquid when dimensioning the supporting structure.
The dimensioning for total weight is also sufficient for the stability against dynamic forces.

D

Danger

The weight of mechanical parts is indicated on machine drawing.
During maintenance operations always use well-sized lifting equipment.

D

Danger

The unit can be supplied with transportation safety locks if indicated at machine documentation or assembly drawing.
Be sure to identify and remove the locks before machine start-up !

4.2 Mechanical risks - Moving parts

D

Danger

The moving parts are enclosed in protective guards.
Do not remove guards except for authorized maintenance operations.

REMARKS AND RESIDUAL RISKS

D**Danger**

During authorized maintenance operations make sure that the machine can't be started from central control room or other remote location.

D**Danger**

If there is the possibility of unauthorized maintenance operations, fit microswitches on protective guards, in order to break the current to the electric motor.

C**Caution**

Do not operate the machine when an abnormal vibration is produced; an excessive vibration level can produce damage to the supporting structure and to unit.

4.3 Heat risks**D****Danger**

Heated parts above 60° C must be insulated for personnel protection.

D**Danger**

Excess heat from moving parts could ignite explosive mixture.

Carefully follow lubricating instructions.

D**Danger**

Check electric motor temperature class for service in potentially explosive areas.

C**Caution**

REMARKS AND RESIDUAL RISKS

Protect the electric motor against overheating with a thermistor.

4.4 Electric risks

D**Danger**

Follow electric motor installation and operating instructions.

D**Danger**

Choose the right electrical protection for the explosive areas.

4.5 Pressure risks

D**Danger**

Never exceed the design pressure indicated at machine nameplate or drawing.

D**Danger**

Never exceed 0.5 bar (g) at process side for the machines designed for vacuum or atmospheric pressure service.

D**Danger**

Never feed live steam inside a machine not designed as a pressure vessel without providing adequate vents.

D**Danger**



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pag.: 5 of 5

Sect.: 4

Revision No:

Date: 31/08/01

REMARKS AND RESIDUAL RISKS

Using liquid heating media never exceed the liquid atmospheric boiling temperature if the machine is not designed as a pressure vessel.

4.6 Process fluid risk

D

Danger

Take all the precautions according to the processed fluid requirements.

D

Danger

In case of service with dangerous fluids always wash and degass the machine before any maintenance operation.

D

Danger

When processing inflammable or explosive fluids, be careful not to have oxygen reaching the process side, use an inert gas to restore atmospheric pressure from vacuum or cool the machine before venting.

TECHNICAL DESCRIPTION AND SAFETY MEASURES

Section 5 TECHNICAL DESCRIPTION AND SAFETY MEASURES

5.1 Drawings and machine components list

At Sections 10 and 11 are annexed:

- Unit Data Sheet.
- Component identification drawing, No. ST 240290 M.
- Lubrication points identification drawing, No. ST 240290 L.
- Machine components specific instructions.

5.2 How the unit works

With reference to Machine Data Sheet, the powder enters the unit through the nozzle S1, then it is intimately mixed with the liquid fed from the spraying nozzles (the nozzles, depending on Process Specification, can be steam heated) located at S8 inlet nozzle, the product is thus granulated by the action of liquid and rotation.

The granules are sieved by the net assembly according to Process Specification, and leave the unit through the nozzle S2, while the granules out of specification are collected at S3 nozzle.

The nozzle S6 can be connected to a suction line for sieve assembly dedusting, refer to Process Specification.

5.3 Materials

They are listed in the assembly drawing and in the machine components list (sect. 14). Verify that the product to be treated in the machine will not corrode these materials.

TECHNICAL DESCRIPTION AND SAFETY MEASURES

5.4 Feed and ambient conditions

They are defined at Ballestra's Process Specification, in doubt please contact M/s Ballestra.

5.5 Technical data

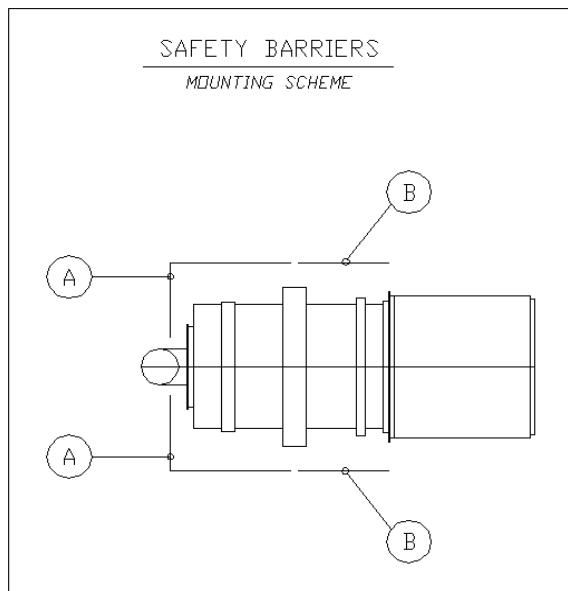
They are defined at assembly drawing (sect. 10) and at nameplate.

5.6 Protections

See Section 4!

Please note that the unit is supplied with safety barriers, to be locally installed, in order to prevent the access to the dangerous area.

Never run the machine without installing the safety barriers!



TECHNICAL DESCRIPTION AND SAFETY MEASURES

5.7 Noise

In test-run conditions, the unit does not exceed a sound pressure level of 75 dB(A).

This value refers to the machine emission, not to the operator exposure.

The measure is done with a sound pressure level meter HD 9018, class of precision 1 as per IEC 651 and IEC 225 codes, class of precision 2 as per IEC 804 code, at 1 m from the machine surface and at 1.60 m from soil.

In case it was required, a noise level certificate for the specific unit is included at Certificates Dossier.

5.8 Vibrations

The machine is checked against abnormal vibration level.

The measured value is acceptable when within the "GOOD" limit according to the VDI 2056 Code, Group "T" table.



Caution

Any rotating machine must be operated on a structure having a resonant frequency at least 20% far from machine rotational speed.

A well balanced machine can produce unacceptable and unpredictable vibrations in resonance conditions.

MOVING AND STORING

Section 6 MOVING AND STORING

6.1 Moving

- 6.1.1 Packing dimensions and weight are indicated on the packing list. Usually the machine is supplied completely pre-assembled. When parts to be moved separately do exist, they are accurately indicated on the packing list.
- 6.1.2 Machine dimensions and weight are shown at assembly drawing (sect. 13).
- 6.1.3 Lifting must be done with slings under the supporting frame and a balancer in order to keep the unit perfectly horizontal during all the operations.
- 6.1.4 **Do not try to lift the unit with slings under the cylindrical body or from the hood!**

P

Caution

Charge for lifting operations only skilled personnel (crane operators etc.), and always have someone at soil for assistance and signals .

6.2 Storing

Be sure that the storing location will not cause damages to machine protections.

INSTALLATION

Section 7 INSTALLATION

7.1 General suggestions

Even though the machine does not require for normal maintenance operations the dismantling of the rotating body, it is useful, whenever possible, to take in account this removal.

To do this, room should be provided, and machine installation should take in account this possibility.

7.2 Positioning

- 7.2.1 The foundation holes are shown at machine Data Sheet drawing here attached (sect. 10). Machine and auxiliary equipment (when present) dimensions are also shown.
- 7.2.2 Position the mixer on the supporting frame which should be calculated for the full weight of the machine, including the complete filling of liquid, or on the concrete basement with counterplates.
- 7.2.3 Using the setting screws provided at machine legs (one of the four M 12 holes), position the machine frame perfectly horizontal, with the help of the reference planes indicated at machine assembly drawing, and of an accurate (sensitivity better than 0.5 mm/m) spirit level.
- 7.2.4 Position the remaining three M 12 screws at each leg in order to support the weight of the unit, then tighten the M 24 foundation bolts, and secure the locking nuts, checking again the horizontality.
- 7.2.5 Check the perfect contact between rolls and revolving drum surfaces, in case repeat what at previous point.
- 7.2.6 Consider that room is always helpful for maintenance, so keep sufficiently away from the machine piping or structure beams which could interfere with machine parts during dismantling and lifting operations.

INSTALLATION

- 7.2.7 The electric motor junction box position is shown at Sect. 11, where power, tension and frequency data for the motor are also indicated.

7.3 Installation completion

C**Caution**

During all the pipe work be careful to avoid any contamination of the interior of the unit (dirtiness, welding spatter etc.).

Connect product inlet and outlet lines, and spraying nozzles piping.

Check drive chain tension and adjust it if necessary.

Lubricate drive chain, supporting rolls bearings and revolving surfaces.

Fit the PTFE ingot in working position.

Connect the electric motor.

PREPARATION TO START UP**Section 8 PREPARATION TO START UP**

- 8.1 Clean the exterior of the machine and the revolving surfaces.
- 8.2 Check the oil level in the reducer (where applicable).
- 8.3 The machine is fitted with locking devices for transportation purposes. Please check the drawing No. 09024 S and remove the locking screws and nuts Positions 88 and 89 (4 pieces in total).
- 8.4 Fit the PTFE ingots (Point 79 at Dwg. 09024 S) into the cleaning device housing Pos.78.
- 8.5 Lubricate the bearings (2 lubrication points, shown at Dwg. 09024/S).
- 8.6 Check the sense of rotation of the motor. (see Dwg. 09024/A)
- 8.7 Start the unit at low frequency and set the correct operating frequency (please consult M/s Ballestra Process Specification).
- 8.8 Start feeding the machine according to M/s Ballestra Process Specification.

MAINTENANCE, DISMANTLING AND REASSEMBLY

Section 9 MAINTENANCE, DISMANTLING AND REASSEMBLY

9.1 Maintenance program

- 9.2 For the horizontal mixer, the parts more likely to wear are the revolving surfaces (if the unit will be operated in a dusty environment), the supporting bearings, the seals on rotating parts (and surfaces where the seals slide), and the drive transmission components (motor, speed reducer, chain and sprockets).
- 9.3 The event of an unpredictable failure for parts subject to wearing has always to be considered, for example for wrong operations or for negligence in operation.
We suggest having in stock always at least a set of spare parts (see sect. 10), if not quickly available from commerce.

We suggest to benefit as much as possible from the scheduled plant shut-downs, controlling in these occasions the most part of components, considering the priority at tab. 9.1 here below, showing the most probable life of the parts when working in normal conditions (preventive maintenance). The actual life can differ even a lot from that in tab. 9.1, due to negligence or thanks to particularly good working conditions.

TAB. 9.1 - MOST PROBABLE LIFE OF COMPONENTS

COMPONENT	MONTHS
Bearings	24 (depends on lubrication)
Gaskets subject to friction	12/24
External elastomers	6/18 (depends on the environment)
Chain	24 (depends on lubrication)
Speed reducer mechanics	60
Electric motor bearings	24 (depends on lubrication)

MAINTENANCE, DISMANTLING AND REASSEMBLY

9.1.3 Hereafter you find our **recommended maintenance check list**.

- | | |
|----------|---|
| Daily: | <ul style="list-style-type: none">• Check for revolving surfaces lubrication conditions |
| Weekly: | <ul style="list-style-type: none">• Watch for leaks from rotating seals. |
| Monthly: | <ul style="list-style-type: none">• Lubricate the chain and check its tensioning• Lubricate the rolls bearings. |
| Yearly: | <ul style="list-style-type: none">• Lubricate motor bearings (if required by the specific instructions).• Have an internal inspection of the machine.• Check gear reducer lubrication according to Manufacturer's instructions.• Check for chain wear. |

9.2 Lubrication

9.2.1 The lubrication of the bearings must be done monthly using always the same kind of grease.

The recommended grease can be chosen between the following ones or equivalent (tab.

9.2.1):

TAB. 9.2.1 - GREASE FOR BEARINGS

BRAND	TYPE
Agip	MU/EP3 (Factory original)
Esso	Beacon n. 2
Shell	Alvania n 2 / n. 3
Mobil Oil	Mobilux EP 2

9.2.2 For speed reducer lubrication see specific instructions (sect. 11).

9.2.3 The chain lubrication should preferably be made with a spray penetrant lubricant or a specific oil, chosen among the following types or an equivalent:

MAINTENANCE, DISMANTLING AND REASSEMBLY

TAB. 9.2.3 - LUBRICANT FOR CHAIN

BRAND	TYPE
Agip/Rocol (Factory original)	Chainguard Hi-Load Spray
Agip/Rocol	Chain & Drive Fluid
Shell	Cardium Fluid D
Mobil Oil	Mobiltac A
Esso	Millcot K-50/K-55

Chain tension can be checked by pulling the chain at the slack side, at the middle of its length, the deviation from chain axis, when pushed and pulled by hand, should be +/- 20 to 30 mm.

In order to check for chain wear, remove the chain and apply a traction load of 80 to 100 kgf, then measure the actual length of N pitches, A mm, and use it with the theoretical $31.25 \times N = T$ mm value in the formula $(A-T/T) \times 100 = V$.

If the resulting V value is over 1%, the chain should be replaced.

9.3 Dismantling and reassembly

C

Caution

Before each intervention on the machine read carefully the related instructions and refer to the sectional drawing (sect. 10).

Always discharge and wash thoroughly the unit before starting the operations.

C

Caution

We recommend to overhaul the machine once a year and to replace worn or damaged parts.

C

Caution

Before each dismantling the recommended spare parts should be in stock (see sect. 11).

MAINTENANCE, DISMANTLING AND REASSEMBLY

D**Danger**

Disconnect the electric motor from the line before any personnel intervention!

For any dismantling, always refer to drawing No. ST 240290 M, enclosed at Section 10.

General rules

Normal wearing parts should be kept in stock. When ordering the spare parts please indicate:

1. Ballestra Job Number and Item Tag
2. Machine model and Serial Number;
3. Drawing Number;
4. Description and Position of the part following the machine drawing No. 09024/S.

It is better to mark every part when dismantling the unit in order to avoid mistakes.

For any intervention on the machine, always keep notice of the following points:

- Avoid local heating of the unit parts since a deformation could result.
- The scales of product on the wall must never be removed with a flame. Use only solvents or water with brushes or soft scrapers.
- During maintenance operations prefer air operated tools and low voltage or battery lamps.

9.3.1 Preliminary operations

- The machine must be operated until the complete discharge and carefully cleaned.

MAINTENANCE, DISMANTLING AND REASSEMBLY

9.3.2 Chain (Pos. 11) removal

- Remove the protection covers and disconnect the removable chain link.

9.3.3 Driving unit removal

- Remove the screws from gear reducer basement.

9.3.4 Toothed crown removal

- Remove the chain as per 9.3.2.
- Remove the fixing screws and the three pieces crown Pos. 15.

9.3.5 Pinion removal

- Remove the chain as per 9.3.2.
- Remove the Pos. 12, 13 and 51 and the pinion Pos. 10 pulling with a suitable extractor.

9.3.6 Replacement and maintenance of the spraying nozzles

- Disconnect and remove the three-pieces pipe connection Pos. 7, the screws and nuts Pos. 22 and 41, and the cover flange at nozzle S8, pulling out in a straight-line the nozzles assembly.
- The spraying nozzles can be serviced and replaced according to the components list at Spraying Nozzles Detail Standard.

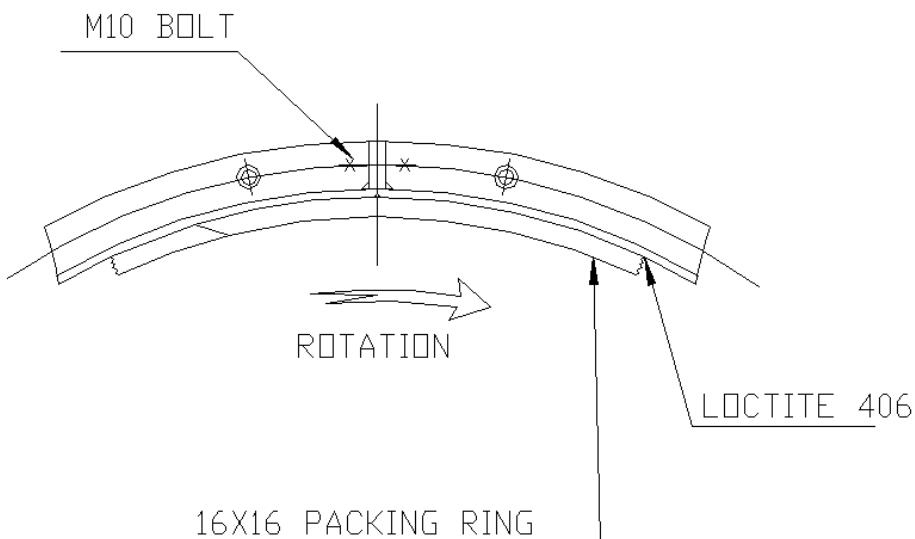
9.3.8 Replacement of sliding gaskets, Pos. 17 and 18

- Disconnect the two half-rings supporting the gasket to be replaced and remove the fixing screws at machine side.
- The half rings are glued to the packing rings and some resistance to the removal is to be expected.
- Remove carefully any trace of glue from the half rings.
- Prepare two packing rings with a 45° cut (length is 2770 mm for inlet side sealing and 4605 mm for outlet side sealing), install them into the seat on the drum as shown hereafter, and fix the ends with Loctite #406 adhesive, keeping the cut of one ring 180°

MAINTENANCE, DISMANTLING AND REASSEMBLY

away from the other. Please note the position of the cut in respect to the rotation direction.

PACKING INSTALLATION (TYPICAL)

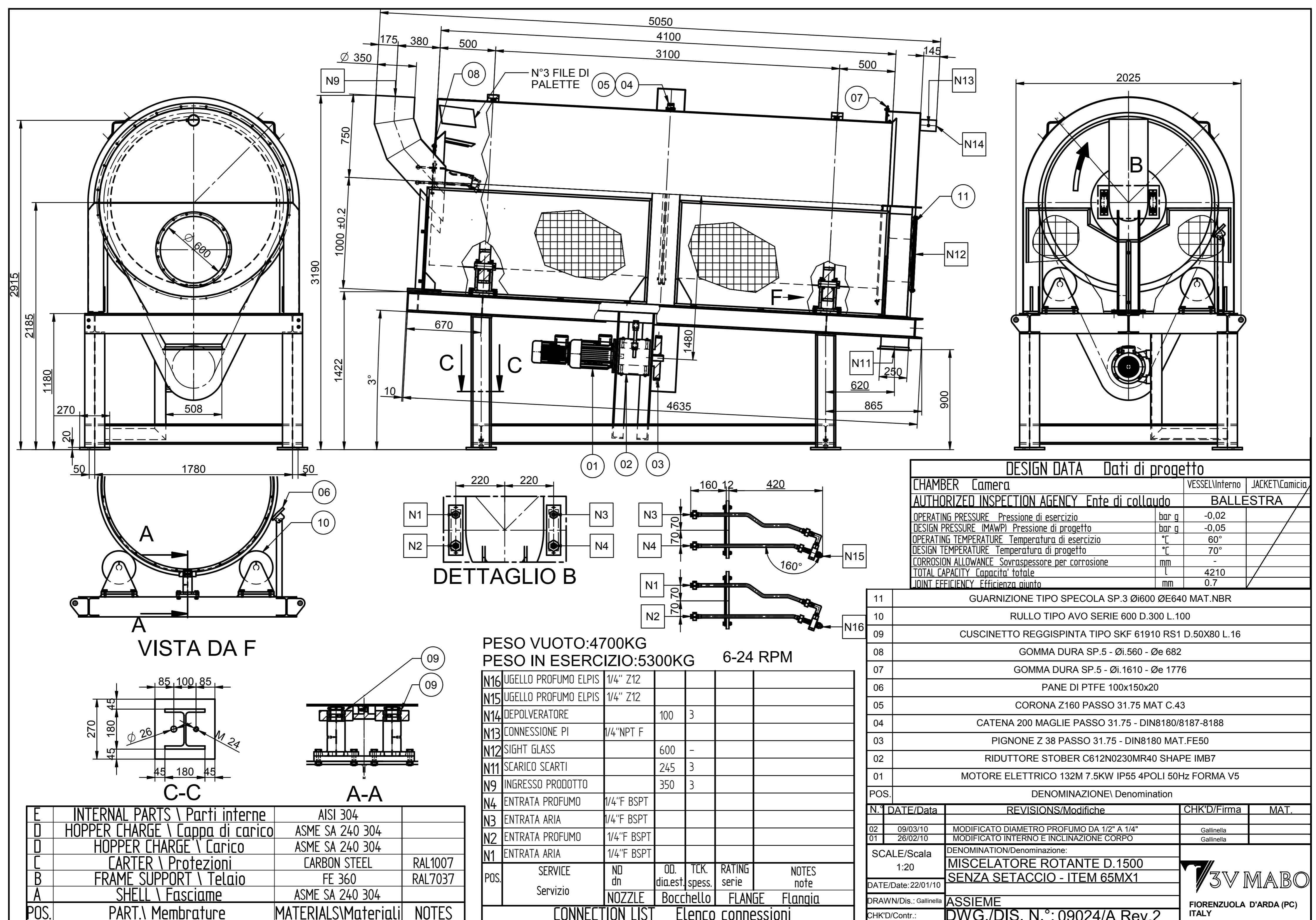


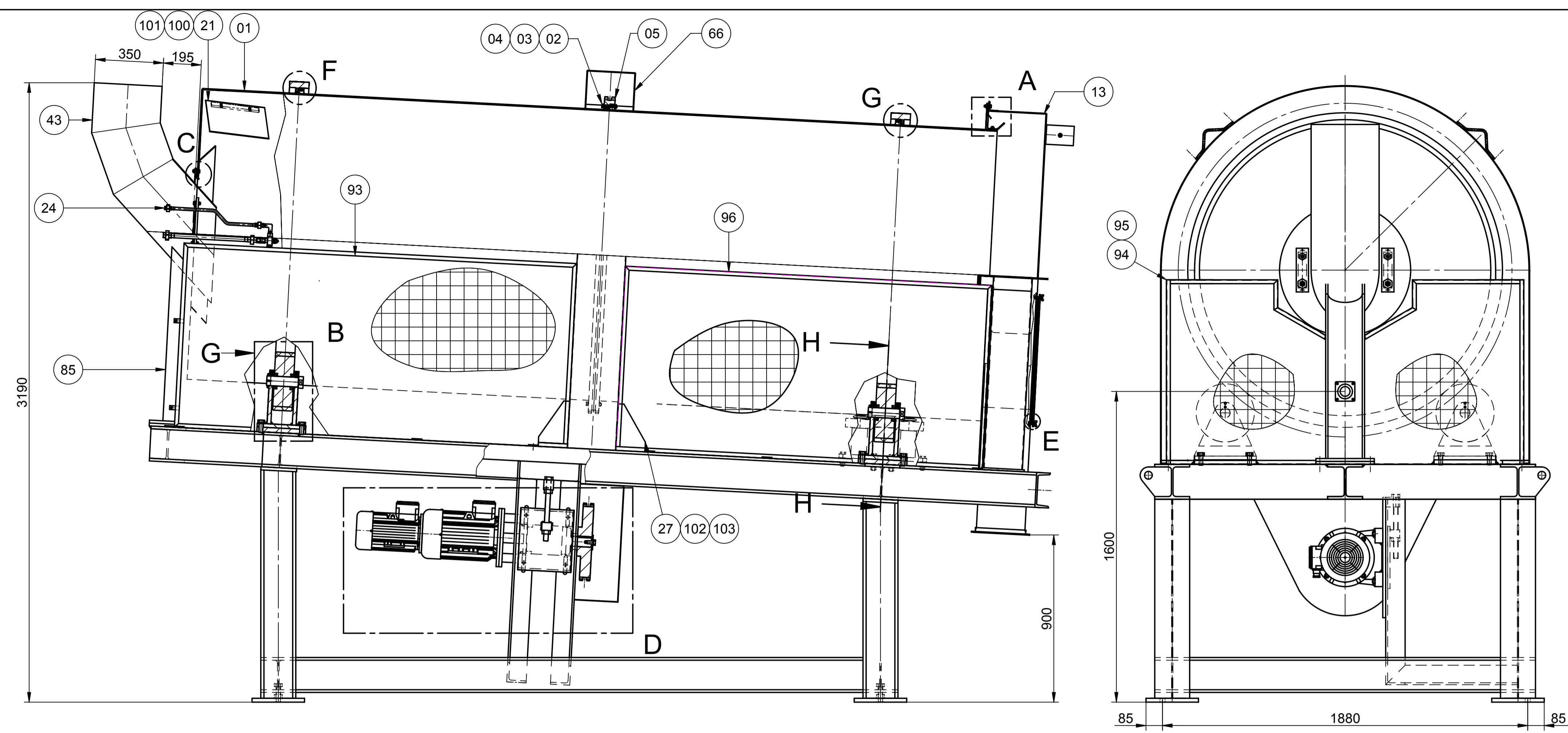
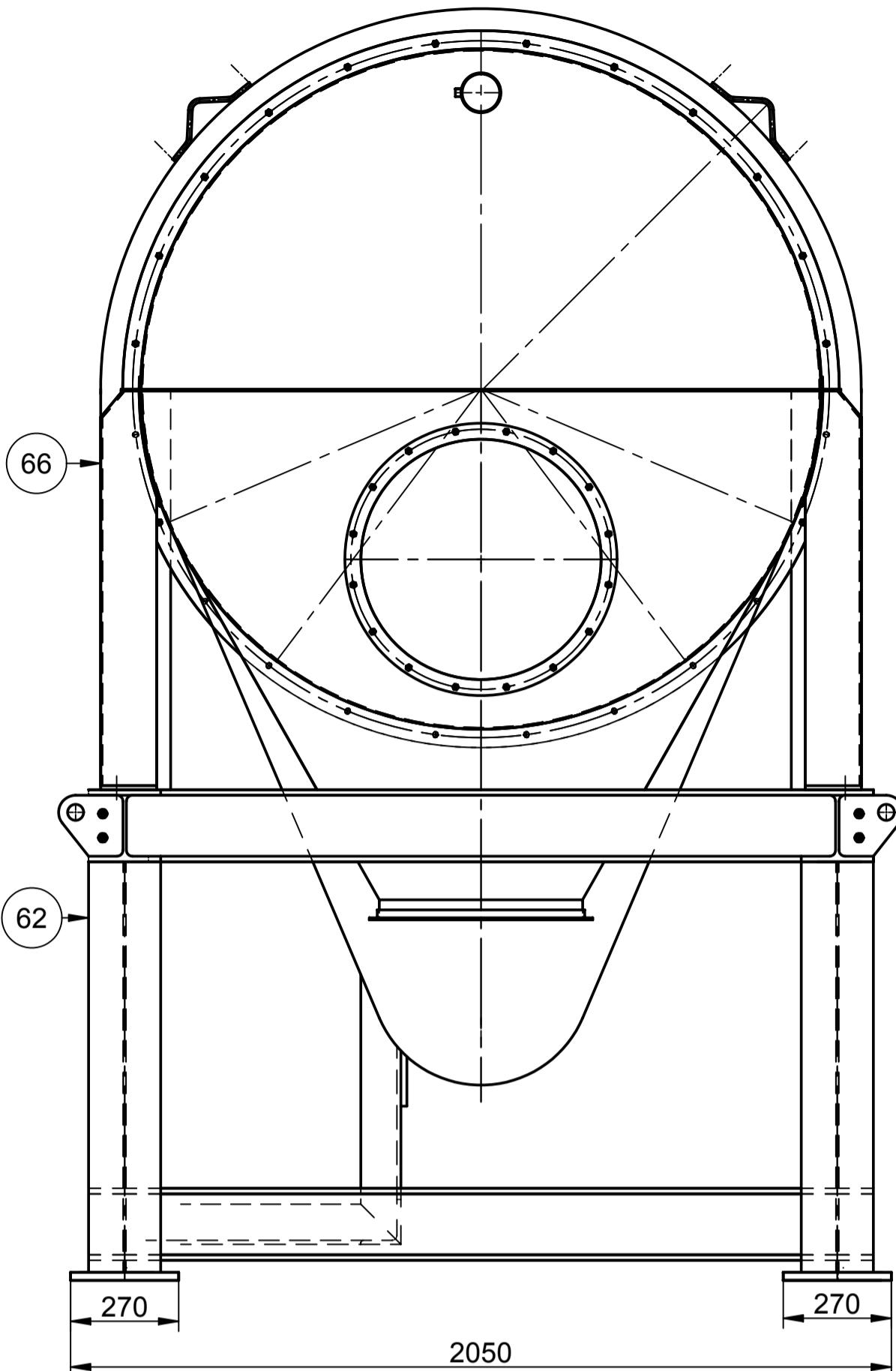
- When the two rings will be in position into the seat, try to fit the two half-ring supports in order to check that everything can be assembled correctly, then put Loctite #406 on packing ring outer diameter, one layer 100 mm long every 100 mm, and position the two half-rings supports. Pay attention to the fact that the glue grips in a very short time the contacting surfaces, thus the positioning must be quick and accurate.
- A new gasket needs a breaking-in period in order to slide with low friction, so to avoid load on electric motor, our recommendation is to substitute one side at a time, to perform a 3-4 hour breaking-in at low speed (5 RPM), then to replace the gaskets at the other side.

MAINTENANCE, DISMANTLING AND REASSEMBLY

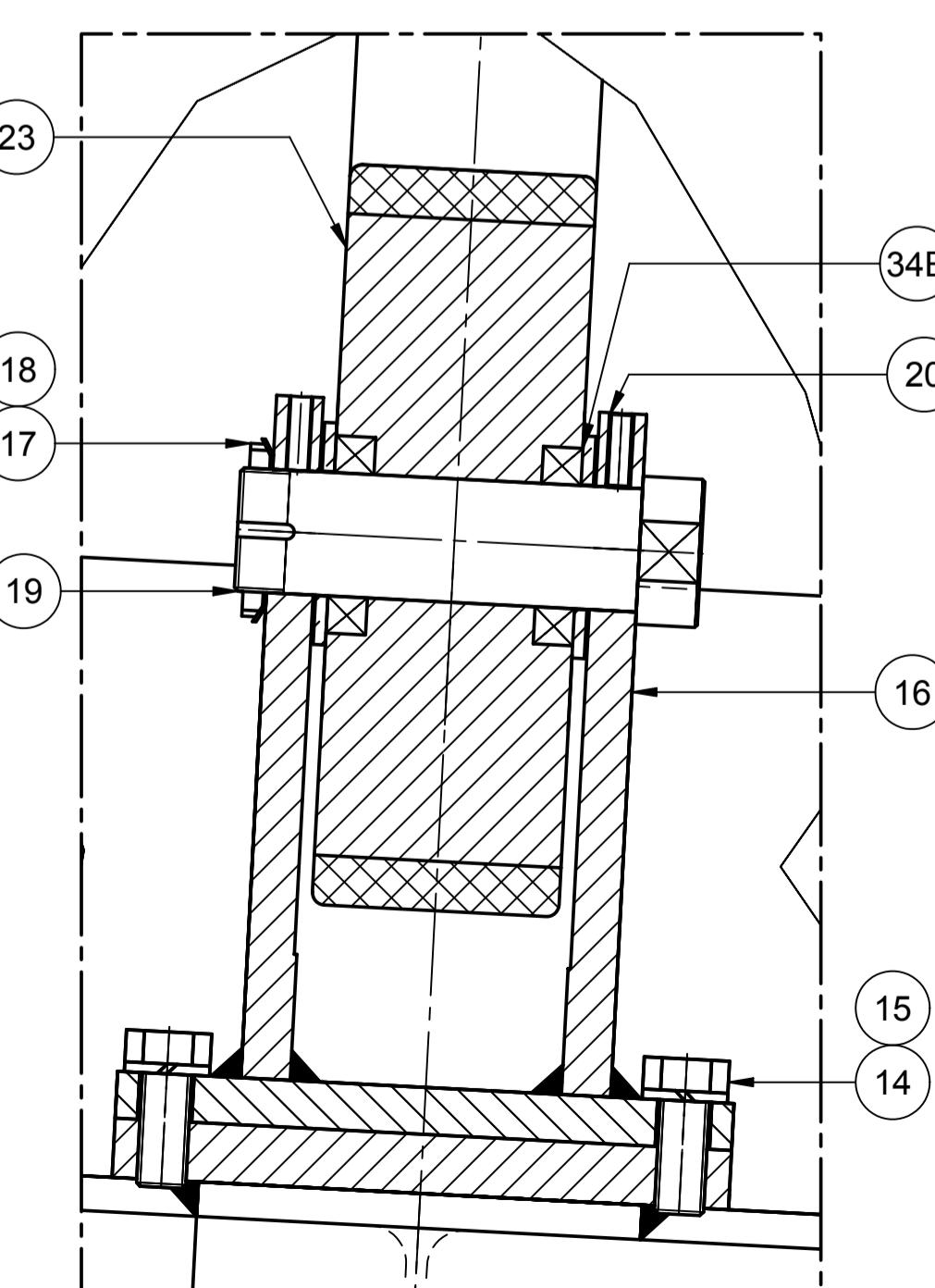
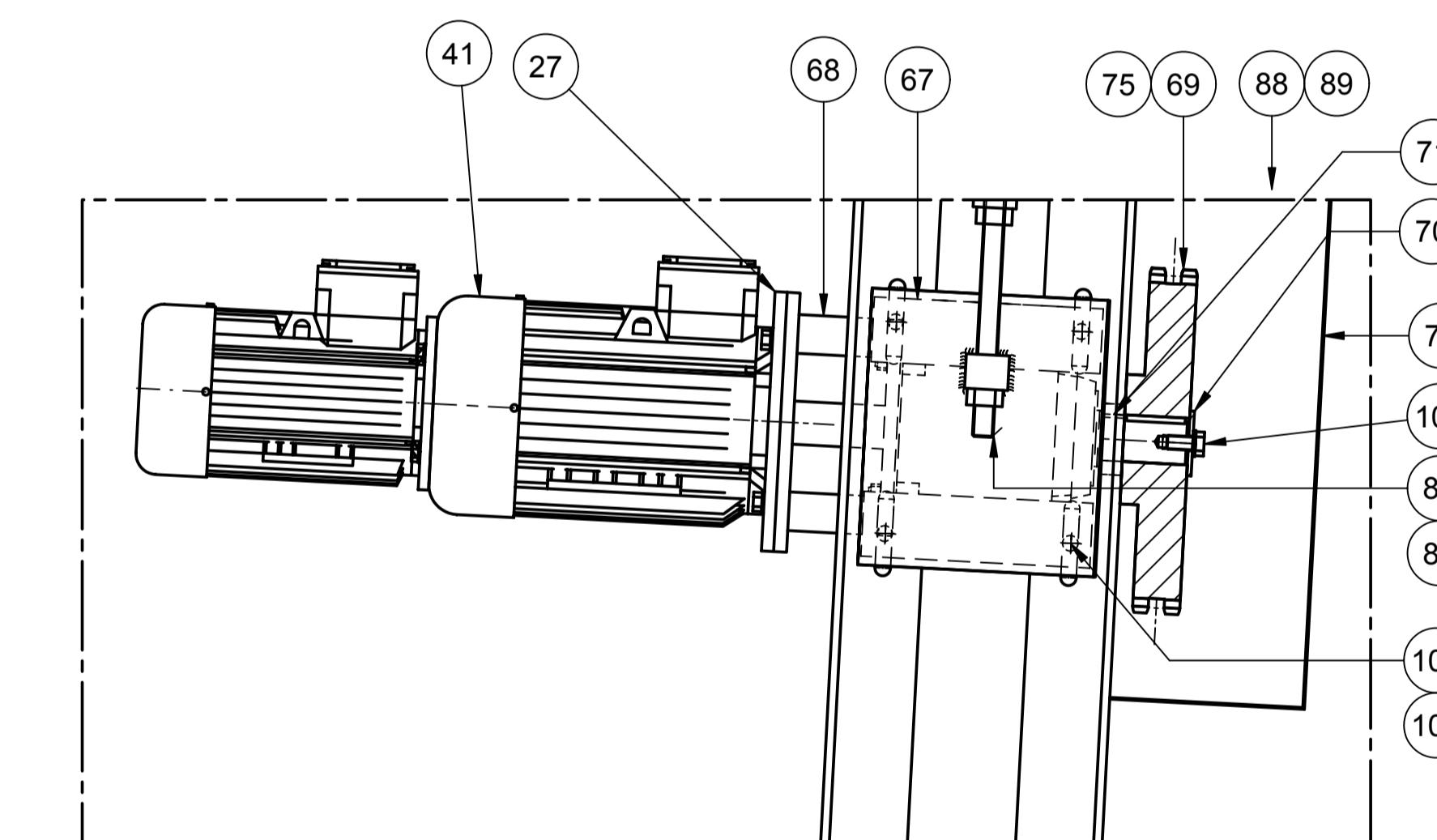
9.3.9 Replacement of thrust bearings

- Flatten the washer 37 edge and remove the nut 36.
- Remove washers 37 and 34 A and push down the shaft 33, removing the bearing 35 and the washer 34.
- Before reassembly, check for the wear condition of the bronze washers 34 and 34 A, their nominal thickness is 3.5 mm.

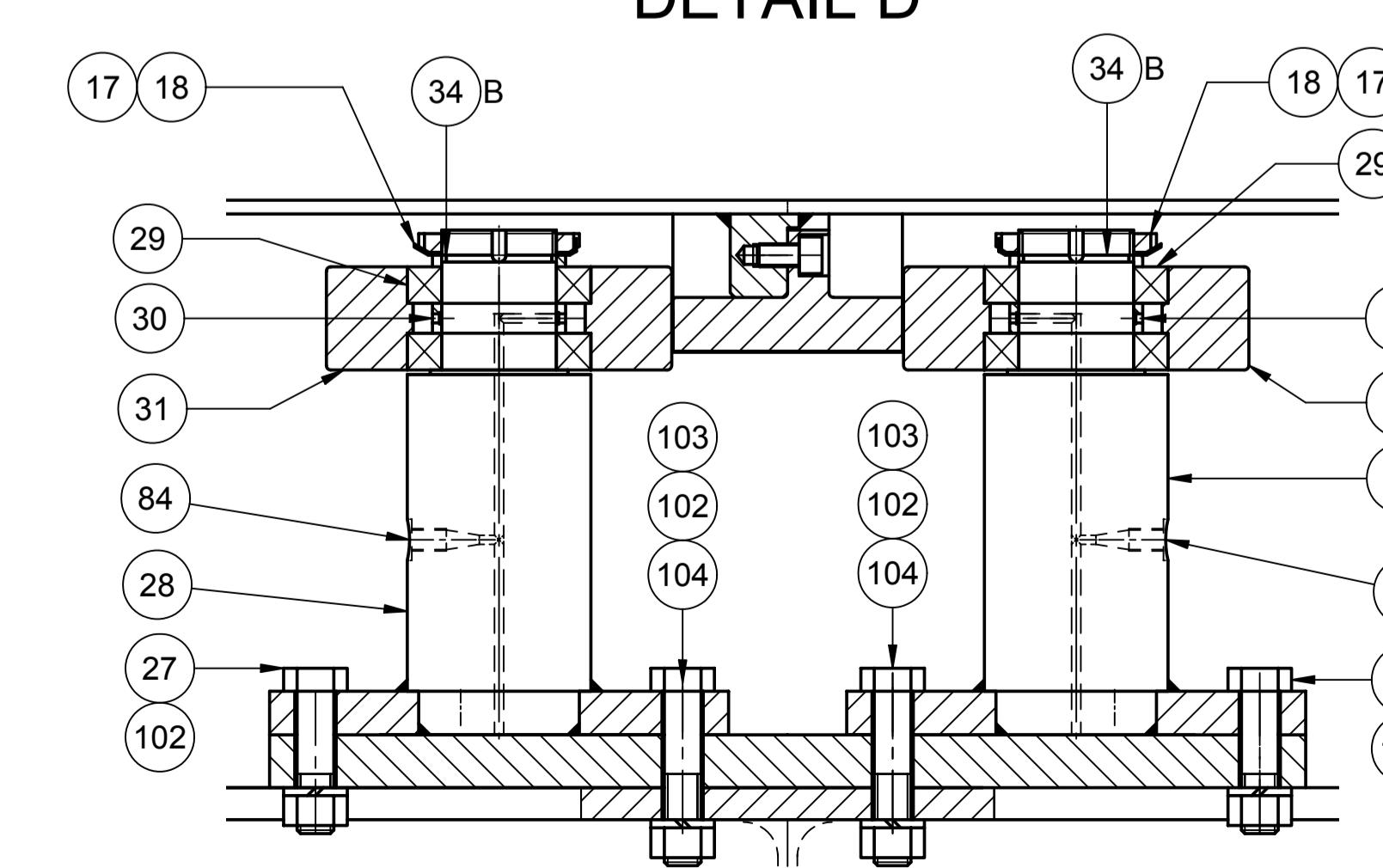




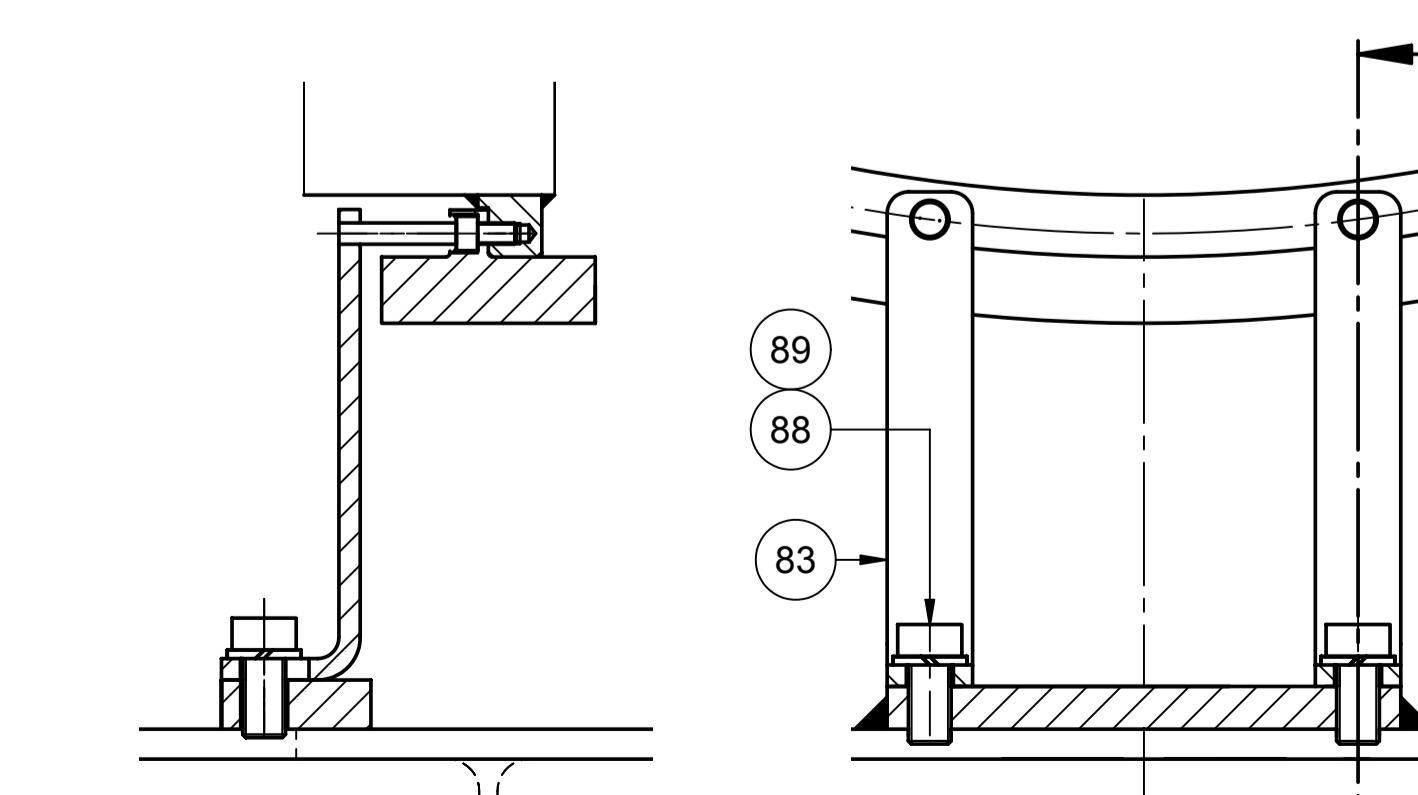
DETAIL



DETTAGLIO B



DETAIL OF ROLLER'S SUPPORT



VIEW FROM G

N.° DATE/Data	REVISIONS/Modifiche	CHK'D/Firma	MAT.
SCALE/Scala	DENOMINATION/Denominazione:	 3V MAB	
	ROTARY MIXER D.1500		
DATE/Date: 31/01/10	SECTION		
DRAWN/Dis.: Gallinella			
CHK'D/Contr.:	DWG./DIS. N.°: 09024/S		

Machine : ROTATING MIX D.1500 WITHOUT SIEVE
Dwg : 09024

Item	Q.ty	Description	Dwg. n°	Material	3V Code	Notes
0 1	1	CYLINDRICAL BODY	09024/1G	AISI 304	42296	
0 10	1	GASKET	05010/10	NBR	32899	
0 100	60	SCREW	M10X20 UNI5739	A4	4524	
0 101	60	WASHER	D.10,4 UNI1751	A4	3080	
0 102	16	NUT	UNI5588 M16	8G	05832	
0 103	17	WASHER	UNI1751 D.17	A4	04687	
0 104	4	SCREW	UNI5739 M16X80	8.8	05712	
0 105	1	SCREW	UNI5739 M16X30	8.8	05705	
0 13	1	EXTERNAL BODY	09024/13G	AISI 304	42307	
0 14	16	SCREW	UNI5739 M20X50	8.8	05719	
0 15	16	WASHER	UNI1751 D.17	A4	04685	
0 16	4	SUPPORT	09002/16	FE 360	39487	
0 17	6	BUSH	M50X1,5 KM10	C.STEEL	07823	
0 18	6	WASHER	D.50 MB1	C.STEEL	07813	
0 19	4	PIN	05010/19	C45	34082	
0 2	24	NUT	UNI5588 M10	8G	08584	
0 20	8	SCREW	UNI5923 M10X30	8.8	32956	
0 21	30	BLADE	05010/1-21	AISI 304	32990	
0 22	1	FLANGE	09002/22	AISI 304	42309	
0 23	4	WHEEL	D.300X100 SERIES 600		S6176	AVO
0 24	1	NOZZLES	09024/24	AISI 304		
0 27	8	SCREW	UNI5739 M16X65	8.8	05710	
0 28	2	SUPPORT	09002/28	FE 360	39488	
0 29	4	BEARING	50/80/10 6010-2RS1	C.STEEL	32902	
0 3	24	SCREW	UNI5739 M10X70	8.8	05688	
0 30	2	SPACER	05010/30	FE 360	32915	
0 31	2	ROLER	09024/31	C40	42312	
0 34A	10	SPACER	05010/34	FE 360	34096	
0 4	24	WASHER	UNI1751 D.10,4	A4	04682	
0 41	1	ELECTRIC MOTOR	7,5KW 4POLES 380/50/3			
0 42	1	GASKET	05010/42	NBR	32922	
0 43	1	CHARGE HOOD	09024/43G	AISI 304	42311	
0 5	1	TOOTHED GEAR	09024/5	C43	42305	
0 6	50	SCREW	UNI5739 M8X30	8.8	05899	
0 62	1	FRAME	09024/62G	FE 360	42297	
0 66	1	PROTECTION	05010/66	FE360	32942	
0 67	1	SUPPORT	09024/67	FE 360	42313	
0 68	1	GEAR REDUCER	C612N0230-MR40			STOBER
0 69	1	PINION	09024/69	C45	42314	
0 7	44	NUT	UNI5588 M8	8G	05829	
0 71	1	SPACER	04025/51A	FE 360	31772	
0 72	1	FLANGE	05010/72	AISI 304	32947	
0 73	1	GASKET	05010/73	NBR	32948	
0 74	1	SIGHT GLASS	D.640 TH.5	POLYCARBONATE		
0 75	1	CHAIN	DIN8187 1 1/4"X3/4" DOUBLE	C.STEEL	32904	
0 76	1	CARTER	05010/76	FE 360	32949	

Machine : ROTATING MIX D.1500 WITHOUT SIEVE

Dwg : 09024

--	--	--	--

Item	Q.ty	Description	Dwg. n°	Material	3V Code	Notes
0 77	2	SUPPORT	05010/77	FE 360	32950	
0 78	2	SUPPORT	05010/78	FE 360	32951	
0 79	2	CLEANER	100X150	PTFE		
0 8	66	WASHER	UNI1751 D8,4	A4	03319	
0 80	48	SCREW	UNI5931 M10X20	8.8	05770	
0 81	2	ROLLER TRACK	09002/81	C40	39475	
0 83	2	SAFETY BLOCK	09002/83	FE 360	39504	
0 84	2	GREASER	UNI7663 FORM 4	C.STELL	07011	
0 85	1	EMERGENCY STOP			32986	
0 86	2	NUT	UNI5588 M24	8G	05835	
0 87	1	STUD BOLT	UNI M24X300	8.8	32996	
0 88	4	SCREW	UNI5739 M12X30	8.8	04001	
0 89	4	WASHER	UNI1751 D.13	A4	03300	
0 9	1	FLANGE	05010/9	FE 360	32898	
0 90	10	NUT	UNI 5588 M12	8G	05830	
0 92	16	NUT	UNI5448 M8	8G	34191	
0 93	1	PROTECTION	05010/93	FE 360	34372	
0 94	1	PROTECTION	05010/94	FE 360	34373	
0 95	1	PROTECTION	05010/95	FE 360	34374	
0 96	1	PROTECTION	05010/96	FE 360	34375	
0 97	1	BASKET	09024/97	AISI 304	42315	
0 98	24	SCREW	TSEI DIN7991 M8X18	AISI 304	29209	

SPARE PARTS LIST

Drawing: 09024

Machine type: ROTATING MIX D.1500 WITHOUT SIEVE

Nº	Dwg	Pos	Description	Code	Material	Q.ty	Rec. Q.ty	Price	Delivery	Notes
1	09024	23	AVO WHEEL	SERIES 600 D.300X100		4	4			
2	09024	29	BEARING	6010-2RS1	CARBON STEEL	6	6			
3	09024	42	GASKET	05010/42	NBR	1	1			
5	09024	73	GASKET	05010/73	NBR	2	4			
7	09024	5	TOOTHEAD GEAR	05010/5	C43	1	1			
8	09024	24	NOZZLE	14BB0.37SS	ALSI 304	1	1			
9	09024	24	NOZZLE	14BB0.37SS	ALSI 304	1	1			
11	09024	68	REDUCER	C612N023MR40		0	0			
12	09024	67	KIT FOR REDUCER	COMPOSED BY SUPPORT, COUPLING, PIGNON, GASKET		1	1			
13	09024	69	PINION	DWG 09024/69		1	1			
14	09024	75	CHAIN	DIN 8187		10	10			MT
15	09024	79	SLIDE	100X150	PTFE	2	2			
16	09024	50	SEEEGER	D.50 UNI 7435	CARBON STEEL	12	12			
17	09024	10	GASKET	05010/10	NBR	1	1			
19	09022	17	BUSH	M50X1,5KM10	CARBON STEEL	9	9			

Note: recommended quantity for commissioning
Delivery: our works, on truck

MGS Speed Reducers

Installation and Start-Up Instructions

Safety Instructions

In order to obtain long life and trouble-free operation from your STOBER drive, it is essential that the proper installation and operating procedures be followed. Failure to follow these instructions will void the drive's warranty.

WARNING: Safety is the most important consideration when operating any type of drive. Through proper application, safe handling methods, and wearing appropriate clothing, you can prevent accidents and injury to yourself and fellow workers.

The torque required by the application must not exceed the rated torque capacity of the drive. For safety purposes, a safety coupling should be installed between the drive and the driven load. Otherwise, overload may cause damage to the interior parts of the drive which may result in breaking the housing. As a result, persons could be injured by flying parts or splashing hot gear oil.



The shafts of STOBER drives rotate at very high speeds and can cut off or severely injure hands, fingers, and arms.

Follow all directions in the service instruction manual. Obey all federal, state and local safety regulations when operating the drive.



- Always be sure electrical power is off while making electrical connections and during installation and maintenance of the unit.
- Keep clothing, hands, and tools away from ventilation openings on motors and from all rotating parts during operation.
- Lift the drive with a double rope sling or other proper lifting equipment of adequate strength. Make sure load is secured and balanced to prevent shifting when unit is being moved. Lifting drives by hand may be dangerous and should be avoided.
- The intended use of lifting lugs is to handle the weight of the unit only. Never use a lifting lug to lift attached assemblies.
- Never operate drive at speeds higher than those shown on the nameplate, or personal injury may result. Contact STOBER Drives Inc., if there is any change of operating conditions from those for which the unit was originally sold (as stamped on the nameplate). Failure to comply could result in personal injury and or machinery damage.
- Always follow good safety practices at all times.

Each drive is tested before delivery. Before installation, however, it is advisable to examine the unit for possible damage which might have occurred during transit. If damage is discovered, it should be immediately reported to the transport agent.

If installation is delayed after receipt of the unit, the drive should be stored in a clean, dry place until put into service. Long term storage requires special procedures. If not kept in a heated, dry area, consult STOBER Drives, Inc. for storage instructions.

NOTE: If it is necessary to clean drive shafts, take care to protect the oil seals.

IMPORTANT: Do not use any device to hammer the unit onto the output shaft during installation since the bearing races could be damaged.

If you have questions about the installation, operation, maintenance or lubrication of the unit, information can be found in this catalog, on our website, or by calling STOBER Technical Support.

Maintenance

With STOBER reducers very little maintenance is required under normal operating conditions. Units supplied without breathers are lubricated for life.

We recommend that the lubrication be changed in units supplied with breathers according to the following schedule:

Normal Operating Conditions	after 5000 Hours
Wet Operating Conditions	after 2000 Hours.

Lubrication and Mounting Position

All STOBER units are shipped filled with the required amount of lubrication (Mobilgear XP600). In order to provide the proper lubrication quantity the mounting position should be specified at the time of order. **No unit will be shipped without the mounting position specified by the customer.**

Vertical mounting may require different seals, bearings, etc. so it is very important to mount the unit in the position for which it was assembled.

IT IS EXTREMELY IMPORTANT THAT THE CORRECT MOUNTING POSITION BE SPECIFIED ON LONG LIFE UNITS. AN ADJUSTMENT CANNOT BE MADE IN THE FIELD FOR INCORRECT MOUNTING.

If food grade or synthetic oil is requested, it will be Mobilgear Special Mist EP220 food grade or Mobilgear SHC630 synthetic.

Table No. 1

Characteristic of STOBER Standard Lubricants

	Mobil 600 XP220	Mobil DTE FM220 Food Grade H1	Mobil SHC630
Anti-Foaming Additives	X	X	Excellent
Corrosion Protection	X	X	Optimum
Extreme Pressure Additives	X	X	X
Friction and Wear Reducing Characteristics	X	X	Superior
Oxidation Protection	X	X	Enhanced
Wide Temperature Range			X

Breathers are provided on larger sizes. See Table No. 2, 3, and 4 for location of drain and vent for each series and mounting position.

FOOD AND BEVERAGE DUTY AND LONG LIFE UNITS DO NOT HAVE BREATHERS. UNITS MUST BE MOUNTED ACCORDING TO THE MOUNTING POSITION ON THE NAMEPLATE.

Some motor manufacturers provide a drain hole in the mounting face of washdown motors. Be sure this hole is covered during washing or when the unit is used in a wet environment.

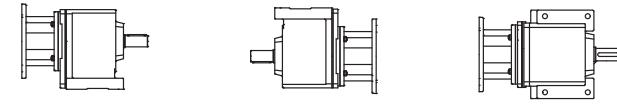
MGS Speed Reducers

Installation and Start-Up Instructions

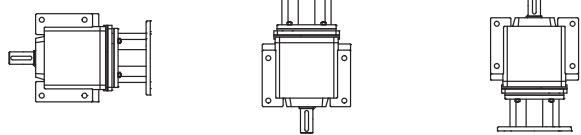


MOUNTING POSITION IS NOT A DESCRIPTION OF THE SHAFT SIDE EXTENSION. Shaft side must be specified – Side 3 or 4.
The right angle units shown below have the shaft on side 4.

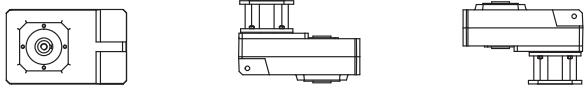
GENERAL PURPOSE



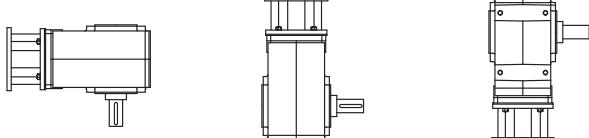
EL1 EL2 EL3
"C" Series Helical In-Line Mounting Positions
 EL4 EL5 EL6



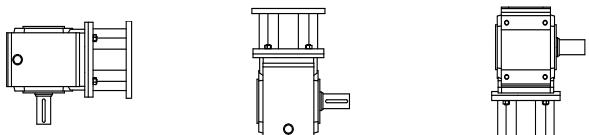
EL1 EL2 EL3
"F" Series Offset Helical Mounting Positions
 EL4 EL5 EL6



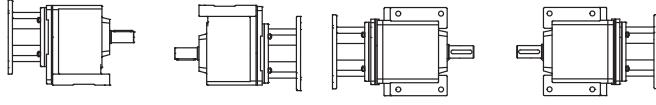
EL1 EL2 EL3
"K" Series Right Angle Helical/Bevel Mounting Positions
 EL4 EL5 EL6



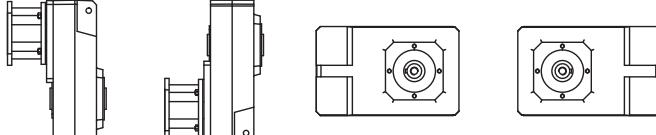
EL1 EL2 EL3
"S" Series Right Angle Helical/Worm Mounting Positions
 EL4 EL5 EL6



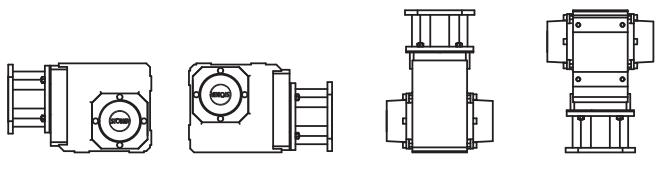
FOOD OR BEVERAGE



EL1 EL2 EL3 EL4
"C" Series Helical In-Line Mounting Positions

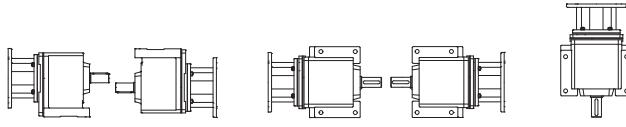


EL1 EL2 EL3 EL4
"F" Series Offset Helical Mounting Positions

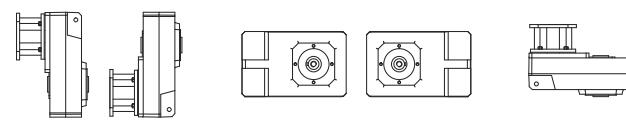


EL1 EL2 EL5 EL6
"K" Series Right Angle Helical/Bevel Mounting Positions

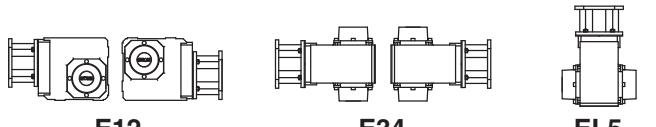
LONG LIFE



E12 E34 EL5
"C" Series Helical In-Line Mounting Positions



E12 E34 EL5
"F" Series Offset Helical Mounting Positions



E12 E34 EL5
"K" Series Right Angle Helical/Bevel Mounting Positions



MGS Speed Reducers Installation and Start-Up Instructions

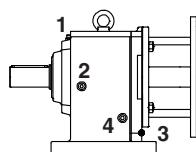
Breather Locations

Breathers are provided on larger sizes of **General Purpose** units. See Table Nos. 2, 3, and 4 for location of drain and vent for each series and mounting position.

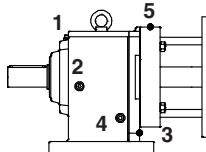
FOOD AND BEVERAGE DUTY AND LONG LIFE UNITS DO NOT HAVE BREATHERS. UNITS MUST BE MOUNTED ACCORDING TO THE MOUNTING POSITION ON THE NAMEPLATE.



"C" Series Helical In-Line



C612-C912



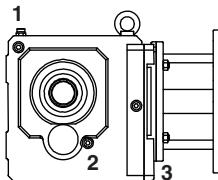
C613-C913

Table No. 2 General Purpose Drain Plug and Vent Location

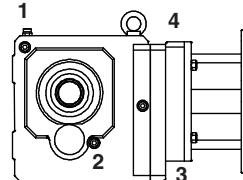
Mounting Position	1	2	2a	3	5
EL1	Vent				
EL2	Drain				
EL3		Vent			
EL4		Drain			
EL5(C612-C912)				Drain	
EL5(C613-C913)				Vent	
EL6		Drain			Vent
		Vent			

Position 2a is on the opposite side of 2.

"K" Series Right Angle Helical/Bevel



K513-K1013



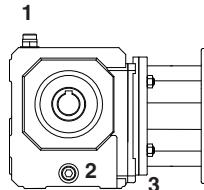
K514-K1014

Table No. 3 General Purpose Drain Plug and Vent Location

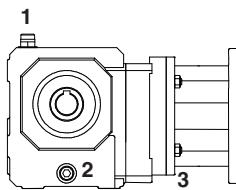
Mounting Position	1	2	2a	3	4
EL1	Vent				
EL2	Drain				
EL3		Vent			
EL4		Drain			
EL5(K513/K1013)				Drain	
EL5(K514/K1014)				Vent	
EL6(K513/K1013)				Drain	Vent
EL6(K514/K1014)				Vent	Drain

Position 2a is on the opposite side of 2.

"S" Series Right Angle Helical/Worm



S102-S402



S203-S403

Table No. 4 General Purpose Drain Plug and Vent Location

Mounting Position	1	2	2a	3
EL1	Vent			
EL2	Drain			
EL3		Vent		
EL4		Drain		
EL5				Drain
EL6		Drain		Vent
		Vent		Drain

Position 2a is on the opposite side of 2.

MGS Speed Reducers

Installation and Start-Up Instructions



Motor Coupling Installation

Step 1. Locate the Motor Coupling on the Motor Shaft

Accurate placement of the motor coupling on the shaft is vital to mounting the motor correctly. Mount the coupling with the hub projection toward the step or shoulder of the motor. The motor coupling should be located from the motor face the "XL" distance shown in Table No. 5.

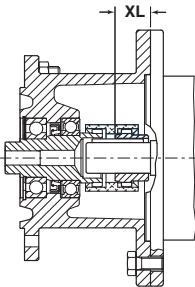


Table No. 5 Location of Motor Coupling

Adapter Part No.	'XL'		Adapter Part No.	'XL'	
	mm	inches		mm	inches
MR140/050	24.5	.96	MR250/210	34	1.3
MR160/050	28	1.1	MR300/180	56	2.2
MR160/140	26	1.0	MR300/210	54	2.1
MR200/050	39	1.5	MR300/250	52	2.0
MR200/140	41	1.6	MR300/280	52	2.0
MR200/180	31	1.2	MR350/320	64	2.5
MR250/180	36	1.4	MR350/360	64	2.5

"XL" Tolerance — +1mm / -0mm (+0.040 / -0.000 inches)

Step 2. Tighten the Setscrew

With the coupling hub located at the correct distance, tighten the setscrew in the coupling.

Step 3. Secure the Motor Shaft Key

For ease of installation, secure the motor shaft key. Staking near the end of the keyway, on the sides of the key, or a temporary adhesive works well.

Step 4. Mount the Motor

With the coupling secure, insert the motor shaft into the motor adapter. The coupling sleeve is already installed on the mating reducer coupling hub inside the motor adapter. **The sleeve should move freely in an axial direction.** (Axial displacement ±.040 inches.)

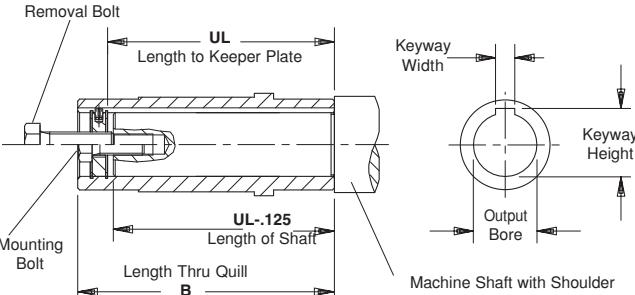
Table No. 6 NEMA Motor Shaft Dimensions

Motor Frame	"AH"	Shaft Dia.	Motor Frame	"AH"	Shaft Dia.
56C	2 ¹ / ₁₆	5/8	254/256TC	3 ³ / ₄	1 ⁵ / ₈
143/145TC	2 ¹ / ₈	7/8	284/286TC	4 ³ / ₈	1 ⁷ / ₈
182/184TC	2 ⁵ / ₈	1 ¹ / ₈	324/326TC	5	2 ¹ / ₈
213/215TC	3 ¹ / ₈	1 ³ / ₈	364/365TC	5 ⁵ / ₈	2 ³ / ₈

With the motor in place, tighten the motor bolts.

CAUTION: IF THE MOTOR COUPLING IS NOT INSTALLED CORRECTLY, THE INPUT BEARING MAY FAIL DUE TO PRE-LOAD. THIS WILL VOID THE WARRANTY OF THE REDUCER AND POSSIBLY FAIL THE MOTOR.

Mounting Hollow Output Reducers



A STOBER hollow output reducer can be mounted from either side. The tolerance for the hollow bore is shown in Table No. 7 and the shaft should be toleranced to fit this bore accordingly.

A keeper plate inside the quill is provided with each unit to prevent axial movement. This keeper plate is held in place with snap rings and can be easily removed for location on either end. A spring pin in the keeper plate mounts into the keyway of the quill and prevents rotation. The keeper plate center hole is tapped to fit the removal bolt.

Before installation, brush the inside of the quill with rust inhibiting grease. When mounting the unit onto the shaft, avoid hammering as this may damage the bearings. Do not mount the reducer dry as removal may be impossible.

Table No. 7 Bore Tolerance

Bore Range	Tolerance
.39 – .71	+.0007/-0.0000
.71 – 1.18	+.0008/-0.0000
1.18 – 1.97	+.0010/-0.0000
1.97 – 3.15	+.0012/-0.0000
3.15 & UP	+.0014/-0.0000

Table No. 8 "UL" Dimension and Removal Bolt Size

Unit	Bore	UL	Bolt	Unit	Bore	UL	Bolt
F1	.750	2.67	3/8-16 NC	K1	1.000	3.86	1 ¹ / ₂ -13 NC
F2	1.000	3.62	1 ¹ / ₂ -13 NC	K2	1.187	4.78	1 ¹ / ₂ -13 NC
F3	1.250	4.06	1 ¹ / ₂ -13 NC	K3	1.375	4.92	5 ⁵ / ₈ -11 NC
F4	1.500	4.49	3 ¹ / ₄ -10 NC	K4	1.500	6.18	3 ¹ / ₄ -10 NC
F6	2.000	5.63	3 ¹ / ₄ -10 NC	K5	2.000	6.46	3 ¹ / ₄ -10 NC
				K6	2.000	7.05	3 ¹ / ₄ -10 NC
S1	1.000	3.86	1 ¹ / ₂ -13 NC	K7	2.375	8.43	1-8 NC
S2	1.375	4.70	5 ⁵ / ₈ -11 NC	K8	2.750	10.35	1-8 NC
S3	1.500	5.39	3 ¹ / ₄ -10 NC	K9	3.250	12.32	1-8 NC
S4	1.750	6.04	3 ¹ / ₄ -10 NC	K10	4.000	14.25	1 ¹ / ₄ -7 NC

The drawing above shows a mounting or fixing bolt and a removal bolt. The mounting/fixing bolt should be smaller in size than the removal bolt. See Table No. 8.

To use the keeper plate with a mounting/fixing bolt, drill and tap the end of the shaft that will be mounted into the reducer. Insert the mounting/fixing bolt through the keeper plate and thread into the shaft end. The machine shaft length should not be longer than the "UL" dimension. A shaft length of "UL minus .125" will allow the shaft shoulder to pull against the face of the quill of the reducer.

Removal of Hollow Output Reducers

To dismantle the unit from the shaft, remove the mounting bolt. Thread the removal bolt into the keeper plate to press against the shaft and loosen the shaft from the unit. Removal of the reducer will be easier if the quill is greased before installation.

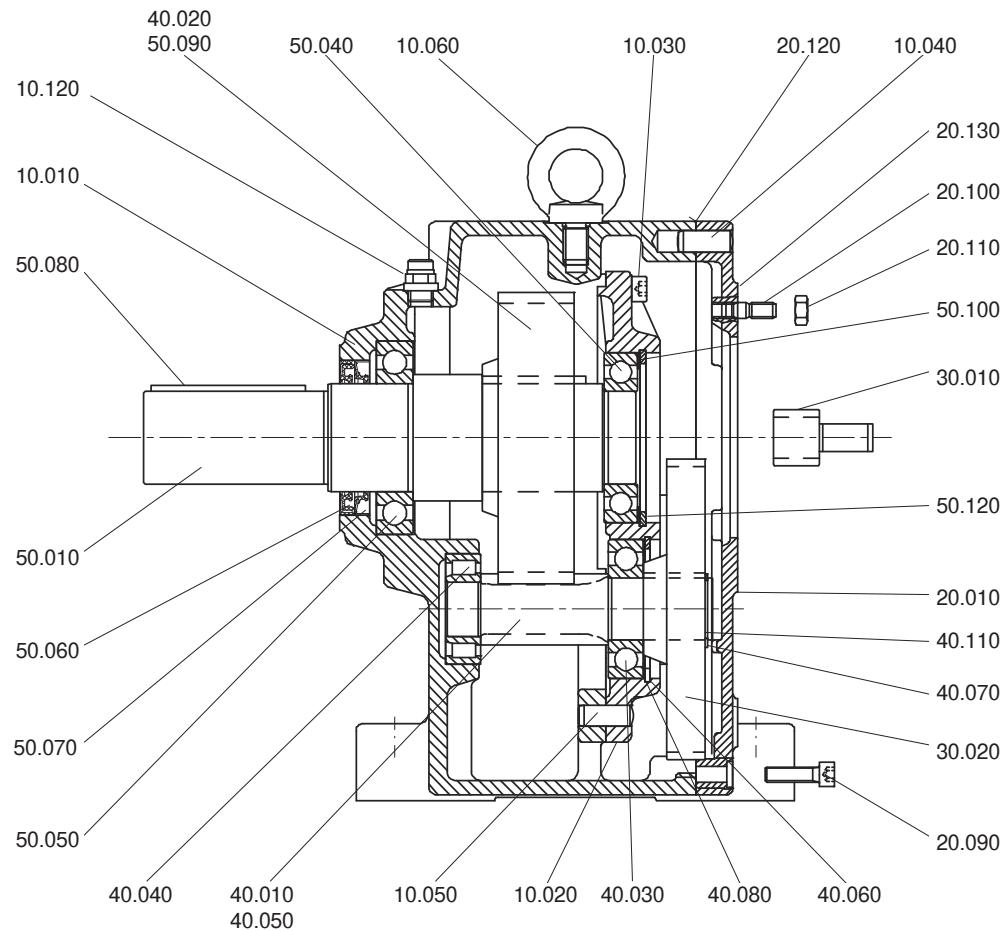
See our web site (www.stober.com) for a parts breakdown of a specific reducer or call Customer Service (606 759-5090).



"C" Series – Concentric Helical Speed Reducer

"N" Housing Style — Foot Mounting

C612N thru C912N



When ordering replacement parts, specify the "Part No." and "Serial No." from the nameplate and the "Location No." shown on the above drawing.



"C" Series – Concentric Helical Speed Reducer

"N" Housing Style — Foot Mounting

C612N thru C912N

Parts List for Double Reduction – "N" Housing Style

Location No.	Description	Location No.	Description	Location No.	Description
10.010	Housing	20.130	Gasket	50.010	Output Shaft
10.020	Bearing Housing	30.010	Stem Pinion	50.040	Deep Groove Ball Bearing
10.030	Hollow Head Capscrew	30.020	Gear	50.050	Deep Groove Ball Bearing
10.040	Dowel Pin	40.010	Pinion Shaft	50.060	Oil Seal
10.050	Dowel Pin	40.020	Gear	50.070	Oil Seal
10.060	Lifting Eyebolt	40.030	Deep Groove Ball Bearing	50.080	Key
10.120	Breather	40.040	Cylindrical Roller Bearing	50.090	Key
20.010	Cover	40.050	Key	50.100	Snap Ring
20.090	Hollow Head Capscrew	40.060	Snap Ring	50.120	Shim
20.100	Stud	40.070	Snap Ring		
20.110	Nut	40.080	Shim		
20.120	Sealing Compound	40.110	Shim		

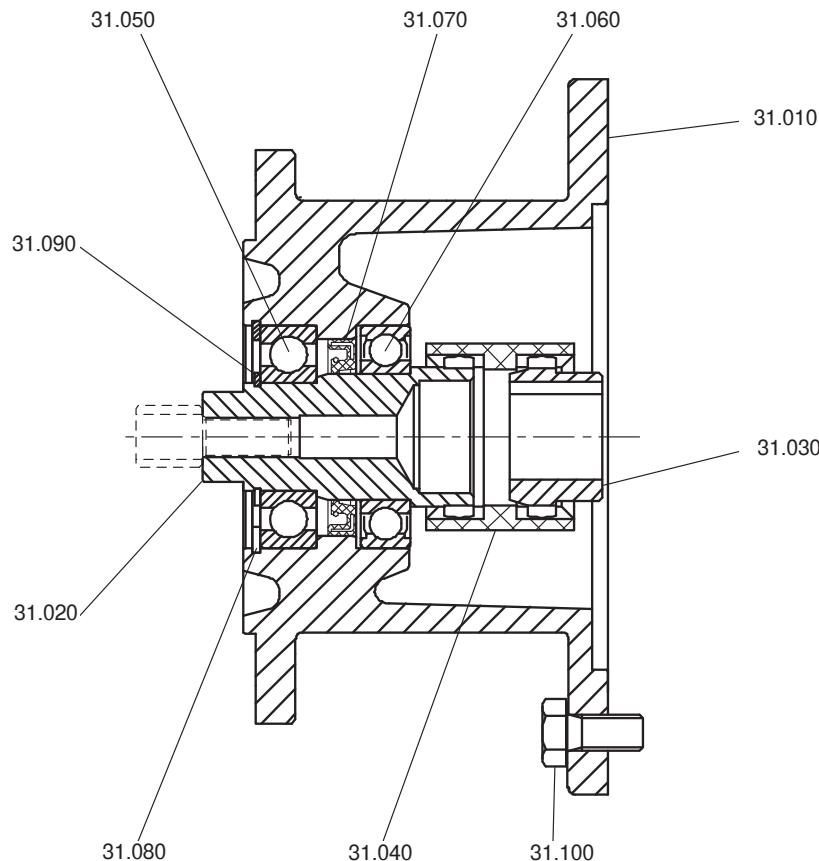
When ordering replacement parts, specify the "Part No." and "Serial No." from the nameplate and the "Location No." shown on the above drawing.

STÖBER Drives Inc. • 1781 Downing Drive • Maysville, KY 41056 • Phone: 606 759-5090 • FAX: 606 759-5045 • www.stober.com

Form No. 2000-6



MR – Motor Adapter
NEMA C-Face
MR140/050 thru MR350/360



Parts List

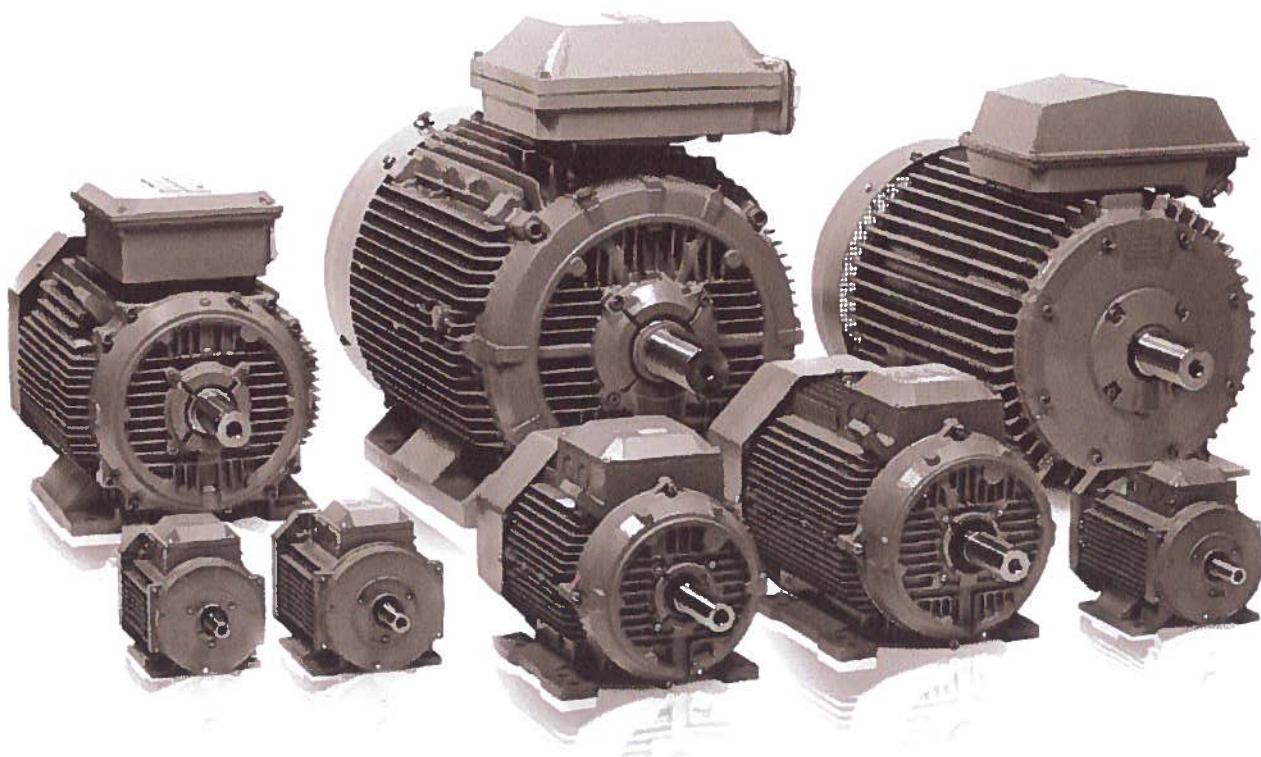
Location No.	Description
31.010	Motor Adapter Housing
31.020	Coupling Hub/Shaft
31.030	Motor Coupling Hub
31.040	Coupling Sleeve
31.050	Ball Bearing
31.060	Ball Bearing
31.070	Seal
31.080	Snap Ring
31.090	Snap Ring
31.100	Capscrew

When ordering replacement parts, specify the "Part No." and "Serial No." from the nameplate and the "Location No." shown on the above drawing.
STÖBER Drives Inc. • 1781 Downing Drive • Maysville, KY 41056 • Phone: 606 759-5090 • FAX: 606 759-5045 • www.stober.com

Form No. 2036-1

Low voltage motors

Manual



Installation, operation, maintenance and safety manual	EN 3
Montage-, Betriebs-, Wartungs- und Sicherheitsanleitung	DE 21
Manuel d'installation, d'exploitation, de maintenance et de sécurité	FR 39
Manual de instalación, funcionamiento, mantenimiento y seguridad	ES 59
Manuale d'installazione, funzionamento e manutenzione	IT 79
Manual de instalação, operação, manutenção e segurança	PT 99
Installations-, driftts-, underhålls- och säkerhetsmanual	SV 119
Asennus-, käyttö-, kunnossapito- ja turvallisuusohje	FI 137

More languages – see web site www.abb.com/motors&generators > Motors > Document library

Power and productivity
for a better world™

ABB



EC Declaration of Conformity

The Manufacturer: *(Name and address of the manufacturer)*

hereby declares that

The Products: *(Product identification)*

are in conformity with the corresponding essential requirements of following EC directive:

Directive 2006/95/EC (of 12 December 2006).

The motors are in compliance with the following harmonized standard:

EN 60 034-1(2004)

which thus comply with Principal Elements of the Safety Objectives for Electrical Equipment stated in Annex I of said directive.

Note: When installing motors for converter supply applications, additional requirements must be respected regarding the motor as well as the installation, as described in installation manual delivered with converters.

Year of CE marking :

Signed by

Title -----

Date -----

Low Voltage Motors

Installation, operation, maintenance and safety manual

List of Contents	Page
1. Introduction	5
1.1 Declaration of Conformity	5
1.2 Validity	5
2. Handling	6
2.1 Reception check	6
2.2 Transportation and storage	6
2.3 Lifting	6
2.4 Machine weight	6
3. Installation and commissioning	7
3.1 General	7
3.2 Insulation resistance check	7
3.3 Foundation	7
3.4 Balancing and fitting coupling halves and pulleys	8
3.5 Mounting and alignment of the motor	8
3.6 Slide rails and belt drives	8
3.7 Machines with drain plugs for condensation	8
3.8 Cabling and electrical connections	8
3.8.1 Connections for different starting methods	9
3.8.2 Connections of auxiliaries	9
3.9 Terminals and direction of rotation	9
4. Operation	10
4.1 Use	10
4.2 Cooling	10
4.3 Safety considerations	10

5. Low voltage motors in variable speed operation	11
5.1 Introduction	11
5.2 Winding insulation	11
5.2.1 Phase to phase voltages	11
5.2.1 Phase to ground voltages	11
5.2.3 Selection of winding insulation for ACS550- and ACS800-converters	11
5.2.4 Selection of winding insulation with all other converters	11
5.3 Thermal protection of windings	11
5.4 Bearing currents	12
5.4.1 Elimination of bearing currents with ABB ACS550 and ACS800 converters	12
5.4.2 Elimination of bearing currents with all other converters	12
5.5 Cabling, grounding and EMC	12
5.6 Operating speed	12
5.7 Dimensioning the motor for variable speed application	12
5.7.1 General	12
5.7.2 Dimensioning with ABB ACS800 converters with DTC control	12
5.7.3 Dimensioning with ABB ACS550 converters	13
5.7.4 Dimensioning with other voltage source PWM-type converters	13
5.7.5 Short time overloads	13
5.8 Rating plates	13
5.9 Commissioning the variable speed application	13
6. Maintenance	14
6.1 General inspection	14
6.1.1 Standby motors	14
6.2 Lubrication	14
6.2.1 Machines with permanently greased bearings	14
6.2.2 Motors with regreasable bearings	15
6.2.3 Lubrication intervals and amounts	15
6.2.4 Lubricants	17
7. After Sales Support	18
7.1 Spare parts	18
7.2 Rewinding	18
7.3 Bearings	18
8. Environmental requirements	18
8.1 Noise levels	18
9. Troubleshooting	19

1. Introduction

NOTE!

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the machine. They should be brought to the attention of anyone who installs, operates or maintains the machine or associated equipment. The machine is intended for installation and use by qualified personnel, familiar with health and safety requirements and national legislation. Ignoring these instructions may invalidate all applicable warranties.

1.2 Validity

The instructions are valid for the following ABB electrical machine types, in both motor and generator operation.

series MT*, MXMA,
series M2A*/M3A*, M2B*/M3B*, M4B*, M2C*/M3C*,
M2F*/M3F*, M2L*/M3L*, M2M*/M3M*, M2Q*,
M2R*/M3R*, M2V*/M3V*
in frame sizes 56 - 450.

There is a separate manual for e.g. Ex motors 'Low voltage motors for hazardous areas: Installation, operation and maintenance Manual' (Low Voltage Motors/Manual for Ex-motors).

Additional information is required for some machine types due to special application and/or design considerations.

Additional information is available for the following motors:

- roller table motors
- water cooled motors
- open drip proof motors
- smoke venting motors
- brake motors
- motors for high ambient temperatures

2. Handling

2.1 Reception check

Immediately upon receipt check the motor for external damage (e.g. shaft-ends and flanges and painted surfaces) and if found, inform the forwarding agent without delay.

Check all rating plate data, especially voltage and winding connection (star or delta). The type of bearing is specified on the rating plate of all motors except the smallest frame sizes.

2.2 Transportation and storage

The motor should always be stored indoors (above -20°C), in dry, vibration free and dust free conditions. During transportation, shocks, falls and humidity should be avoided. In other conditions, please contact ABB.

Unprotected machined surfaces (shaft-ends and flanges) should be treated against corrosion.

It is recommended that shafts are rotated periodically by hand to prevent grease migration.

Anti-condensation heaters, if fitted, are recommended to be used to avoid water condensing in the motor.

The motor must not be subject to any external vibrations at standstill so as to avoid causing damage to the bearings.

Motors fitted with cylindrical-roller and/or angular contact bearings must be fitted with locking devices during transport.

2.3 Lifting

All ABB motors above 25 kg are equipped with lifting lugs or eyebolts.

Only the main lifting lugs or eyebolts of the motor should be used for lifting the motor. They must not be used to lift the motor when it is attached to other equipment.

Lifting lugs for auxiliaries (e.g. brakes, separate cooling fans) or terminal boxes must not be used for lifting the motor.

Motors with the same frame may have a different center of gravity because of different output, mounting arrangements and auxiliary equipment.

Damaged lifting lugs must not be used. Check that eyebolts or integrated lifting lugs are undamaged before lifting.

Lifting eyebolts must be tightened before lifting. If needed, the position of the eyebolt can be adjusted using suitable washers as spacers.

Ensure that proper lifting equipment is used and that the sizes of the hooks are suitable for the lifting lugs.

Care must be taken not to damage auxiliary equipment and cables connected to the motor.

2.4 Machine weight

The total machine weight can vary within the same frame size (center height) depending on different output, mounting arrangement and auxiliaries.

The following table shows estimated maximum weights for machines in their basic versions as a function of frame material.

The actual weight of all ABB's motors, except the smallest frame sizes (56 and 63) is shown on the rating plate.

Frame size	Aluminum Weight kg	Cast iron Weight kg	Steel Weight kg	Add. for brake
56	4.5	-	-	-
63	6	-	-	-
71	8	13	-	5
80	12	20	-	8
90	17	30	-	10
100	25	40	-	16
112	36	50	-	20
132	63	90	-	30
160	95	130	-	30
180	135	190	-	45
200	200	275	-	55
225	265	360	-	75
250	305	405	-	75
280	390	800	600	-
315	-	1700	1000	-
355	-	2700	2200	-
400	-	3500	3000	-
450	-	4500	-	-

3. Installation and commissioning

WARNING

Disconnect and lock out before working on the motor or the driven equipment.

Insulation resistance, corrected to 25°C, must exceed the reference value, i.e. 100 MΩ (measured with 500 or 1000 V DC). The insulation resistance value is halved for each 20°C rise in ambient temperature.

3.1 General

All rating plate values must be carefully checked to ensure that the motor protection and connection will be properly done.

WARNING

In case of motors mounted with the shaft upwards and water or liquids are expected to go down along the shaft, the user must take in account to mount some means capable of preventing it.

Remove transport locking if employed. Turn shaft by hand to check free rotation if possible.

Motors equipped with roller bearings:

Running the motor with no radial force applied to the shaft may damage the roller bearing.

Motors equipped with angular contact bearing:

Running the motor with no axial force applied in the right direction in relation to the shaft may damage the angular contact bearing.

WARNING

For machines with angular contact bearings the axial force must not by any means change direction.

The type of bearing is specified on the rating plate.

Motors equipped with regreasing nipples:

When starting the motor for the first time, or after long storage, apply the specified quantity of grease.

For details, see section "6.2.2 Motors with regreasable bearings".

3.2 Insulation resistance check

Measure insulation resistance before commissioning and when winding dampness is suspected.

WARNING

Disconnect and lock out before working on the motor or the driven equipment.

WARNING

The motor frame must be grounded and the windings should be discharged against the frame immediately after each measurement to avoid risk of electrical shock.

If the reference resistance value is not attained, the winding is too damp and must be oven dried. The oven temperature should be 90°C for 12-16 hours followed by 105°C for 6-8 hours.

Drain hole plugs, if fitted, must be removed and closing valves, if fitted, must be opened during heating. After heating, make sure the plugs are refitted. Even if the drain plugs are fitted, it is recommended to disassemble the end shields and terminal box covers for the drying process.

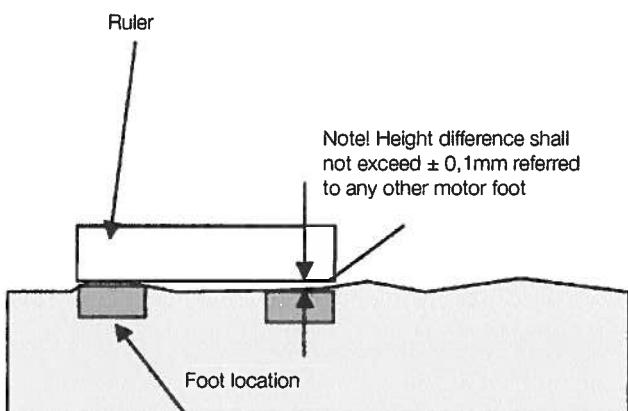
Windings drenched in seawater normally need to be rewound.

3.3 Foundation

The end user has full responsibility for preparation of the foundation.

Metal foundations should be painted to avoid corrosion.

Foundations must be even, see figure below, and sufficiently rigid to withstand possible short circuit forces. They must be designed and dimensioned to avoid the transfer of vibration to the motor and vibration caused by resonance.



3.4 Balancing and fitting coupling halves and pulleys

As standard, balancing of the motor has been carried out using half key

When balancing with full key, the shaft is marked with YELLOW tape, with the text "Balanced with full key".

In case of balancing without key, the shaft is marked with BLUE tape, with the text "Balanced without key".

Coupling halves or pulleys must be balanced after machining the keyways. Balancing must be done in accordance with the balancing method specified for the motor.

Coupling halves and pulleys must be fitted on the shaft by using suitable equipment and tools which do not damage the bearings and seals.

Never fit a coupling half or pulley by hammering or by removing it using a lever pressed against the body of the motor.

3.5 Mounting and alignment of the motor

Ensure that there is enough space for free airflow around the motor. Minimum requirements for free space behind the motor fan cover can be found from the product catalog or from the dimension drawings available from the web: see www.abb.com/motors&generators.

Correct alignment is essential to avoid bearing, vibration and possible shaft failures.

Mount the motor on the foundation using the appropriate bolts or studs and place shim plates between the foundation and the feet.

Align the motor using appropriate methods.

If applicable, drill locating holes and fix the locating pins into position.

Mounting accuracy of coupling half: check that clearance b is less than 0.05 mm and that the difference a₁ to a₂ is also less than 0.05 mm. See Figure 3.

Re-check the alignment after final tightening of the bolts or studs.

Do not exceed permissible loading values for bearings as stated in the product catalogues.

3.6 Slide rails and belt drives

Fasten the motor to the slide rails as shown in Figure 2.

Place the slide rails horizontally on the same level.

Check that the motor shaft is parallel with the drive shaft.

Belts must be tensioned according to the instructions of the supplier of the driven equipment. However, do not exceed the maximum belt forces (i.e. radial bearing loading) stated in the relevant product catalogues.

WARNING

Excessive belt tension will damage bearings and can cause shaft damage.

3.7 Machines with drain plugs for condensation

Check that drain holes and plugs face downwards.

Machines with sealable plastic drain plugs are delivered in open position. In very dusty environments, all drain holes should be closed.

3.8 Cabling and electrical connections

The terminal box on standard single speed motors normally contains six winding terminals and at least one earth terminal.

In addition to the main winding and earthing terminals, the terminal box can also contain connections for thermistors, heating elements or other auxiliary devices.

Suitable cable lugs must be used for the connection of all main cables. Cables for auxiliaries can be connected into their terminal blocks as such.

Machines are intended for fixed installation only. If not otherwise specified, cable entry threads are metric. The IP-class of the cable gland must be at least the same as those of the terminal boxes.

Unused cable entries must be closed with blanking elements according to the IP class of the terminal box.

The degree of protection and diameter are specified in the documents relating to the cable gland.

WARNING

Use appropriate cable glands and seals in the cable entries according to the type and diameter of the cable.

Additional information on cables and glands suitable for variable speed applications can be found from chapter 5.5.

Earthing must be carried out according to local regulations before the machine is connected to the supply voltage.

Ensure that the motor protection corresponds to the environment and weather conditions; for example, make sure that water cannot enter the motor or the terminal boxes.

The seals of terminal boxes must be placed correctly in the slots provided, to ensure the correct IP class.

3.8.1 Connections for different starting methods

The terminal box on standard single speed motors normally contains six winding terminals and at least one earth terminal. This enables the use of DOL- or Y/D -starting. See Figure 1.

For two-speed and special motors, the supply connection must follow the instructions inside the terminal box or in the motor manual.

The voltage and connection are stamped on the rating plate.

Direct-on-line starting (DOL):

Y or D winding connections may be used.

For example, 690 VY, 400 VD indicates Y-connection for 690 V and D-connection for 400 V.

Star/Delta starting (Y/D):

The supply voltage must be equal to the rated voltage of the motor when using a D-connection.

Remove all connection links from the terminal block.

Other starting methods and severe starting conditions:

In case other starting methods are used, such as a soft starter, or if starting conditions are particularly difficult, please consult ABB first.

3.8.2 Connections of auxiliaries

If a motor is equipped with thermistors or other RTDs (Pt100, thermal relays, etc.) and auxiliary devices, it is recommended they be used and connected by appropriate means. Connection diagrams for auxiliary elements and connection parts can be found inside the terminal box.

Maximum measuring voltage for the thermistors is 2.5 V. Maximum measuring current for Pt100 is 5 mA. Using a higher measuring voltage or current may cause errors in readings or damage the system.

The insulations of the winding thermal sensors is of basic type. While connecting the sensors to control systems etc, ensure adequate insulation or isolation, see IEC 60664.

NOTE!

Ensure the insulation level or isolation of thermistor circuit, see IEC 60664.

3.9 Terminals and direction of rotation

The shaft rotates clockwise when viewing the shaft face at the motor drive end, and the line phase sequence - L1, L2, L3 - is connected to the terminals as shown in Figure 1.

To alter the direction of rotation, interchange any two connections on the supply cables.

If the motor has a unidirectional fan, ensure that it rotates in the same direction as the arrow marked on the motor.

4. Operation

4.1 Use

The motors are designed for the following conditions unless otherwise stated on the rating plate.

- Normal ambient temperature limits are -20°C to +40°C.
- Maximum altitude 1000 m above sea level.
- Tolerance for supply voltage is $\pm 5\%$ and for frequency $\pm 2\%$ according to EN / IEC 60034-1 (2004).

The motor can only be used in applications it is intended for. The rated nominal values and operational conditions are shown on the motor rating plates. In addition, all requirements of this manual and other related instructions and standards must be followed.

If these limits are exceeded, motor data and construction data must be checked. Please contact ABB for further information.

WARNING

Ignoring any of given instructions or maintenance of the apparatus may jeopardize the safety and thus prevents the use of the machine.

4.2 Cooling

Check that the motor has sufficient airflow. Ensure that no nearby objects or direct sunshine radiate additional heat to the motor.

For flange mounted motors (e.g. B5, B35, V1), make sure that the construction allows sufficient air flow on the outer surface of the flange.

4.3 Safety considerations

The machine is intended for installation and use by qualified personnel, familiar with health and safety requirements and national legislation.

Safety equipment necessary for the prevention of accidents at the installation and operating site must be provided in accordance with local regulations.

WARNING

Do not carry out work on motor, connection cables or accessories such as frequency converters, starters, brakes, thermistor cables or heating elements when voltage is applied.

Points to observe

1. Do not step on the motor.
2. The temperature of the outer casing of the motor may be too hot to touch during normal operation and especially after shut-down.
3. Some special motor applications require special instructions (e.g. using frequency converter supplies).
4. Be aware of rotating parts of the motor.
5. Do not open terminal boxes while energized.

5. Low voltage motors in variable speed operation

5.1 Introduction

This part of the manual provides additional instructions for motors used in frequency converter supply. Instructions provided in this and respective manuals of selected frequency converter must be followed to ensure safety and availability of the motor.

Additional information may be required by ABB to decide on the suitability for some machine types used in special applications or with special design modifications.

5.2 Winding insulation

Variable speed drives cause higher voltage stresses than the sinusoidal supply on the winding of the motor and therefore the winding insulation of the motor as well as the filter at the converter output must be dimensioned according following instructions.

5.2.1 Phase to phase voltages

The maximum allowed phase to phase voltage peaks at the motor terminal as a function of the rise time of the pulse can be seen in Figure 1.

The highest curve "ABB Special Insulation" applies to motors with a special winding insulation for frequency converter supply, variant code 405.

The "ABB Standard Insulation" applies to all other motors covered by this manual.

5.2.2 Phase to ground voltages

The allowed phase to ground voltage peaks at motor terminals are:

Standard Insulation 1300 V peak

Special Insulation 1800 V peak

5.2.3 Selection of winding insulation for ACS800 and ACS550 converters

In the case of ABB ACS800-series and ACS550-series single drives with a diode supply unit (uncontrolled DC voltage), the selection of winding insulation and filters can be made according to table below:

Nominal supply voltage U_N of the converter	Winding insulation and filters required
$U_N \leq 500$ V	ABB Standard insulation
$U_N \leq 600$ V	ABB Standard insulation + dU/dt filters OR ABB Special insulation (variant code 405)
$U_N \leq 690$ V	ABB Special insulation (variant code 405) AND dU/dt-filters at converter output
$U_N \leq 690$ V AND cable length > 150 m	ABB Special insulation (variant code 405)

For more information on resistor braking and converters with controlled supply units, please contact ABB.

5.2.4 Selection of winding insulation with all other converters

The voltage stresses must be limited below accepted limits. Please contact the system supplier to ensure the safety of the application. The influence of possible filters must be taken into account while dimensioning the motor.

5.3 Thermal protection

Most of the motors covered by this manual are equipped with PTC thermistors in the stator windings. It is recommended to connect those to the frequency converter by appropriate means. See also chapter 3.8.2.

5.4 Bearing currents

Insulated bearings or bearing constructions, common mode filters and suitable cabling and grounding methods must be used according to the following instructions:

5.4.1 Elimination of bearing currents with ABB ACS800 and ACS550 converters

In the case of the ABB ACS800 and ACS550-series frequency converter with a diode supply unit, the following methods must be used to avoid harmful bearing currents in the motors:

Nominal Power (Pn) and / or Frame size (IEC)	Preventive measures
Pn < 100 kW	No actions needed
Pn ≥ 100 kW OR IEC 315 ≤ Frame size ≤ IEC 355	Insulated non-drive end bearing
Pn ≥ 350 kW OR IEC 400 ≤ Frame size ≤ IEC 450	Insulated non-drive end bearing AND Common mode filter at the converter

Insulated bearings which have aluminum oxide coated inner and/or outer bores or ceramic rolling elements, are recommended. Aluminum oxide coatings shall also be treated with a sealant to prevent dirt and humidity penetrating into the porous coating. For the exact type of bearing insulation, see the motor's rating plate. Changing the bearing type or insulation method without ABB's permission is prohibited.

5.4.2 Elimination of bearing currents with all other converters

The user is responsible for protecting the motor and driven equipment from harmful bearing currents. Instructions described in Chapter 5.4.1 can be used as guideline, but their effectiveness cannot be guaranteed in all cases.

5.5 Cabling, grounding and EMC

To provide proper grounding and to ensure compliance with any applicable EMC requirements, motors above 30 kW shall be cabled by shielded symmetrical cables and EMC glands, i.e. cable glands providing 360° bonding. Also for smaller motors symmetrical and shielded cables are highly recommended. Make the 360° grounding arrangement at all the cable entries as described in the instructions for the glands. Twist the cable shields into bundles and connect to the nearest ground terminal/bus bar inside the terminal box, converter cabinet, etc.

NOTE!

Proper cable glands providing 360° bonding must be used at all termination points, e.g. at motor, converter, possible safety switch, etc.

For motors of frame size IEC 280 and upward, additional potential equalization between the motor frame and the driven equipment is needed, unless both are mounted on a common steel base. In this case, the high frequency conductivity of the connection provided by the steel base should be checked by, for example, measuring the potential difference between the components.

More information about grounding and cabling of variable speed drives can be found in the manual "Grounding and cabling of the drive system" (Code: 3AFY 61201998).

5.6 Operating speed

For speeds higher than the nominal speed stated on the motor's rating plate or in the respective product catalogue, ensure that either the highest permissible rotational speed of the motor or the critical speed of the whole application is not exceeded.

5.7 Dimensioning the motor for variable speed application

5.7.1 General

In case of ABB's frequency converters, the motors can be dimensioned by using ABB's DriveSize dimensioning program. The tool is downloadable from the ABB website (www.abb.com/motors&generators).

For application supplied by other converters, the motors must be dimensioned manually. For more information, please contact ABB.

The loadability curves (or load capacity curves) are based on nominal supply voltage. Operation in under or over voltage conditions may influence on the performance of the application.

5.7.2 Dimensioning with ABB ACS800 converters with DTC control

The loadability curves presented in Figures 4a - 4d are valid for ABB ACS800 converters with uncontrolled DC-voltage and DTC-control. The figures show the approximate maximum continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor. The values are indicative and exact values are available on request.

NOTE!

The maximum speed of the motor must not be exceeded!

5.7.3 Dimensioning with ABB ACS550 converters

The loadability curves presented in Figures 5a - 5d are valid for ABB ACS550 series converters. The figures show the approximate maximum continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor. The values are indicative and exact values are available on request.

NOTE!

The maximum speed of the motor must not be exceeded!

5.7.4 Dimensioning with other voltage source PWM-type converters

For other converters, which have uncontrolled DC voltage and minimum switching frequency of 3 kHz, the dimensioning instructions of ACS550 can be used as guidelines, but it shall be noted, that the actual thermal loadability can also be lower. Please contact the manufacturer of the converter or the system supplier.

NOTE!

The actual thermal loadability of a motor may be lower than shown by guideline curves.

5.7.5 Short time overloads

ABB motors can usually be temporarily overloaded as well as used in intermittent duties. The most convenient method to dimension such applications is to use the DriveSize tool.

5.8 Rating plates

The usage of ABB's motors in variable speed applications do not usually require additional rating plates and the parameters required for commissioning the converter can be found from the main rating plate. However, in some special applications the motors can be equipped with additional rating plates for variable speed applications and those include following information:

- speed range
- power range
- voltage and current range
- type of torque (constant or quadratic)
- converter type and required minimum switching frequency

5.9 Commissioning the variable speed application

The commissioning of the variable speed application must be done according to the instructions of the frequency converter and local laws and regulations. The requirements and limitations set by the application must also be taken into account.

All parameters needed for setting the converter must be taken from the motor rating plates. The most often needed parameters are:

- Motor nominal voltage
- Motor nominal current
- Motor nominal frequency
- Motor nominal speed
- Motor nominal power

Note: In case of missing or inaccurate information, do not operate the motor before ensuring correct settings!

ABB recommends using all the suitable protective features provided by the converter to improve the safety of the application. Converters usually provide features such as (names and availability of features depend on manufacturer and model of the converter):

- Minimum speed
- Maximum speed
- Acceleration and deceleration times
- Maximum current
- Maximum Torque
- Stall protection

6. Maintenance

WARNING

Voltage may be connected at standstill inside the terminal box for heating elements or direct winding heating.

WARNING

The capacitor in single-phase motors can retain a charge that appears across the motor terminals, even when the motor has reached standstill.

WARNING

A motor with frequency converter supply may energize even if the motor is at standstill.

6.1 General inspection

1. Inspect the motor at regular intervals, at least once a year. The frequency of checks depends on, for example, the humidity level of the ambient air and on the local weather conditions. This can initially be determined experimentally and must then be strictly adhered to.
2. Keep the motor clean and ensure free ventilation airflow. If the motor is used in a dusty environment, the ventilation system must be regularly checked and cleaned.
3. Check the condition of shaft seals (e.g. V-ring or radial seal) and replace if necessary.
4. Check the condition of connections and mounting and assembly bolts.
5. Check the bearing condition by listening for any unusual noise, vibration measurement, bearing temperature, inspection of spent grease or SPM bearing monitoring. Pay special attention to bearings when their calculated rated life time is coming to an end.

When signs of wear are noticed, dismantle the motor, check the parts and replace if necessary. When bearings are changed, replacement bearings must be of the same type as those originally fitted. The shaft seals have to be replaced with seals of the same quality and characteristics as the originals when changing bearings.

In the case of the IP 55 motor and when the motor has been delivered with a plug closed, it is advisable to periodically open the drain plugs in order to ensure that the way out for condensation is not blocked and allows condensation to escape from the motor. This operation must be done when the motor is at a standstill and has been made safe to work on.

6.1.1 Standby motors

If the motor is in standby for a longer period of time on a ship or in other vibrating environment the following measures have to be taken:

1. The shaft must be rotated regularly every 2 weeks (to be reported) by means of start up of the system. In case a start up is not possible, due to any reason, at least the shaft has to be turned by hand in order to achieve a different position once a week. Vibrations caused by other vessel's equipment will cause bearing pitting which should be minimized by regular operation / hand turning.
2. The bearing must be greased while rotating the shaft every year (to be reported). If the motor has been provided with roller bearing at the driven end the transport lock to be removed before rotating the shaft. The transport locking must be remounted in case of transportation.
3. All vibrations must be avoided to prevent a bearing from failing. All instructions in the motor instruction manual for commissioning and maintenance have to be followed additionally. The warranty will not cover the winding and bearing damages if these instructions have not been followed.

6.2 Lubrication

WARNING

Beware of all rotating parts!

WARNING

Grease can cause skin irritation and eye inflammation. Follow all safety precautions specified by the manufacturer.

Bearing types are specified in the respective product catalogs and on the rating plate of all motors except smaller frame sizes.

Reliability is a vital issue for bearing lubrication intervals. ABB uses mainly the L₁₀-principle (i.e. that 99% of the motors are certain to make the life time) for lubrication.

6.2.1 Machines with permanently greased bearings

Bearings are usually permanently greased bearings of 1Z, 2Z, 2RS or equivalent types.

As a guide, adequate lubrication for sizes up to 250 can be achieved for the following duration, according to L₁₀:

Duty hours for permanently greased bearings at ambient temperatures of 25 and 40° C are:

Lubrication intervals according to L_{10} principle

Frame size	Poles	Duty hours at 25° C	Duty hours at 40° C
56-63	2-8	40 000	40 000
71	2	40 000	40 000
71	4-8	40 000	40 000
80-90	2	40 000	40 000
80-90	4-8	40 000	40 000
100-112	2	40 000	32 000
100-112	4-8	40 000	40 000
132	2	40 000	27 000
132	4-8	40 000	40 000
160	2	40 000	36 000
160	4-8	40 000	40 000
180	2	38 000	38 000
180	4-8	40 000	40 000
200	2	27 000	27 000
200	4-8	40 000	40 000
225	2	23 000	18 000
225	4-8	40 000	40 000
250	2	16 000	13 000
250	4-8	40 000	39 000

Data valid at 50 Hz, for 60 Hz reduce values for 20 %.

These values are valid for permitted load values given in the product catalog. Depending on application and load conditions, see the applicable product catalog or contact ABB.

Operation hours for vertical motors are half of the above values.

6.2.2 Motors with regreasable bearings

Lubrication information plate and general lubrication advice

If the machine is equipped with a lubrication information plate, follow the given values.

On the lubrication information plate, greasing intervals regarding mounting, ambient temperature and rotational speed are defined.

During the first start or after a bearing lubrication a temporary temperature rise may appear, approximately 10 to 20 hours.

Some motors may be equipped with a collector for old grease. Follow the special instructions given for the equipment.

A. Manual lubrication

Regreasing while the motor is running

- Remove grease outlet plug or open closing valve if fitted.
- Be sure that the lubrication channel is open
- Inject the specified amount of grease into the bearing.

- Let the motor run for 1-2 hours to ensure that all excess grease is forced out of the bearing. Close the grease outlet plug or closing valve if fitted.

Regreasing while the motor is at a standstill

If it is not possible to re grease the bearings while the motors are running, lubrication can be carried out while the machine is at a standstill.

- In this case use only half the quantity of grease and then run the motor for a few minutes at full speed.
- When the motor has stopped, apply the rest of the specified amount of grease to the bearing.
- After 1-2 running hours close the grease outlet plug or closing valve if fitted.

B. Automatic lubrication

The grease outlet plug must be removed permanently with automatic lubrication or open closing valve if fitted.

ABB recommends only the use of electromechanical systems.

The amount of grease per lubrication interval stated in the table should be multiplied by four if an automatic regreasing system is used.

When 2-pole motors are automatically regreased, the note concerning lubricant recommendations for 2-pole motors in the Lubricants chapter should be followed.

6.2.3 Lubrication intervals and amounts

As a guide, adequate lubrication for motors with regreasable bearings can be achieved for the following duration, according to L_1 . For duties with higher ambient temperatures please contact ABB. The formula to change the L_1 values roughly to L_{10} values: $L_{10} = 2.7 \times L_1$.

Lubrication intervals for vertical machines are half of the values shown in the table below.

The lubrication intervals are based on an ambient temperature +25°C. An increase in the ambient temperature raises the temperature of the bearings correspondingly. The values should be halved for a 15°C increase and may be doubled for a 15°C decrease.

In variable speed operation (i.e. frequency converter supply) it is necessary to measure the bearing temperature for the whole duty range and if exceeds 80°C, the lubrication intervals should be halved for a 15°C increase in bearing temperature. If the motor is operated at high speeds, it is also possible to utilize so called high speed greases, see chapter 6.2.4.

WARNING

The maximum operating temperature of the grease and bearings, +110°C, must not be exceeded.
The designed maximum speed of the motor must not be exceeded.

Lubrication intervals according to L₁ principle

Frame size	Amount of grease g/bearing	kW	3600 r/min	3000 r/min	kW	1800 r/min	1500 r/min	kW	1000 r/min	kW	500-900 r/min
Ball bearings											
Lubrication intervals in duty hours											
112	10	all	10000	13000	all	18000	21000	all	25000	all	28000
132	15	all	9000	11000	all	17000	19000	all	23000	all	26500
160	25	≤ 18,5	9000	12000	≤ 15	18000	21500	≤ 11	24000	all	24000
160	25	> 18,5	7500	10000	> 15	15000	18000	> 11	22500	all	24000
180	30	≤ 22	7000	9000	≤ 22	15500	18500	≤ 15	24000	all	24000
180	30	> 22	6000	8500	> 22	14000	17000	> 15	21000	all	24000
200	40	≤ 37	5500	8000	≤ 30	14500	17500	≤ 22	23000	all	24000
200	40	> 37	3000	5500	> 30	10000	12000	> 22	16000	all	20000
225	50	≤ 45	4000	6500	≤ 45	13000	16500	≤ 30	22000	all	24000
225	50	> 45	1500	2500	> 45	5000	6000	> 30	8000	all	10000
250	60	≤ 55	2500	4000	≤ 55	9000	11500	≤ 37	15000	all	18000
250	60	> 55	1000	1500	> 55	3500	4500	> 37	6000	all	7000
280 ¹⁾	60	all	2000	3500	-	-	-	-	-	-	-
280 ¹⁾	60	-	-	-	all	8000	10500	all	14000	all	17000
280	35	all	1900	3200	-	-	-	-	-	-	-
280	40	-	-	-	all	7800	9600	all	13900	all	15000
315	35	all	1900	3200	-	-	-	-	-	-	-
315	55	-	-	-	all	5900	7600	all	11800	all	12900
355	35	all	1900	3200	-	-	-	-	-	-	-
355	70	-	-	-	all	4000	5600	all	9600	all	10700
400	40	all	1500	2700	-	-	-	-	-	-	-
400	85	-	-	-	all	3200	4700	all	8600	all	9700
450	40	all	1500	2700	-	-	-	-	-	-	-
450	95	-	-	-	all	2500	3900	all	7700	all	8700

	Roller bearings										
	Lubrication intervals in duty hours										
160	25	≤ 18,5	4500	6000	≤ 15	9000	10500	≤ 11	12000	all	12000
160	25	> 18,5	3500	5000	> 15	7500	9000	> 11	11000	all	12000
180	30	≤ 22	3500	4500	≤ 22	7500	9000	≤ 15	12000	all	12000
180	30	> 22	3000	4000	> 22	7000	8500	> 15	10500	all	12000
200	40	≤ 37	2750	4000	≤ 30	7000	8500	≤ 22	11500	all	12000
200	40	> 37	1500	2500	> 30	5000	6000	> 22	8000	all	10000
225	50	≤ 45	2000	3000	≤ 45	6500	8000	≤ 30	11000	all	12000
225	50	> 45	750	1250	> 45	2500	3000	> 30	4000	all	5000
250	60	≤ 55	1000	2000	≤ 55	4500	5500	≤ 37	7500	all	9000
250	60	> 55	500	750	> 55	1500	2000	> 37	3000	all	3500
280 ¹⁾	60	all	1000	1750	-	-	-	-	-	-	-
280 ¹⁾	70	-	-	-	all	4000	5250	all	7000	all	8500
280	35	all	900	1600	-	-	-	-	-	-	-
280	40	-	-	-	all	4000	5300	all	7000	all	8500
315	35	all	900	1600	-	-	-	-	-	-	-
315	55	-	-	-	all	2900	3800	all	5900	all	6500
355	35	all	900	1600	-	-	-	-	-	-	-
355	70	-	-	-	all	2000	2800	all	4800	all	5400
400	40	all	-	1300	-	-	-	-	-	-	-
400	85	-	-	-	all	1600	2400	all	4300	all	4800
450	40	all	-	1300	-	-	-	-	-	-	-
450	95	-	-	-	all	1300	2000	all	3800	all	4400

1) M3AA

For motors M4BP 160 to 250 the interval may be increased by 30 %, up to a maximum of three calendar years.
The values in table above are valid also for sizes M4BP 280 to 355.

6.2.4 Lubricants

WARNING

Do not mix different types of grease.

Incompatible lubricants may cause bearing damage.

When regreasing, use only special ball bearing grease with the following properties:

- good quality grease with lithium complex soap and with mineral- or PAO-oil
- base oil viscosity 100-160 cST at 40°C
- consistency NLGI grade 1.5 - 3 *)
- temperature range -30°C - +120°C, continuously.

*) For vertical mounted motors or in hot conditions a stiffer end of scale is recommended.

The above mentioned grease specification is valid if the ambient temperature is above -30°C or below +55°C, and the bearing temperature is below 110°C; otherwise consult ABB regarding suitable grease.

Grease with the correct properties is available from all the major lubricant manufacturers.

Admixtures are recommended, but a written guarantee must be obtained from the lubricant manufacturer, especially concerning EP admixtures, that admixtures do not damage bearings or the properties of lubricants at the operating temperature range.

WARNING

Lubricants containing EP admixtures are not recommended in high bearing temperatures in frame sizes 280 to 450.

The following high performance greases can be used:

- | | |
|----------|---|
| - Esso | Unirex N2 or N3 (lithium complex base) |
| - Mobil | Mobilith SHC 100 (lithium complex base) |
| - Shell | Gadus S5 V 100 2 (lithium complex base) |
| - Klüber | Klüberplex BEM 41-132 (special lithium base) |
| - FAG | Arcanol TEMP110 (lithium complex base) |
| - Lubcon | Turmogrease L 802 EP PLUS
(special lithium base) |
| - Total | Multiplex S 2 A (lithium complex base) |

NOTE!

Always use high speed grease for high speed 2-pole machines where the speed factor is higher than 480,000 (calculated as $D_m \times n$ where D_m = average bearing diameter, mm; n = rotational speed, r/min). The high speed grease is also used in motor types M2CA, M2FA, M2CG and M2FG, frame sizes 355 to 400 2-pole machines.

The following greases can be used for high speed cast iron motors but not mixed with lithium complex greases:

- | | |
|----------|---|
| - Klüber | Klüber Quiet BQH 72-102 (polyurea base) |
| - Lubcon | Turmogrease PU703 (polyurea base) |

If other lubricants are used:

Check with the manufacturer that the qualities correspond to those of the above mentioned lubricants. The lubrication interval are based on the listed high performance greases above. Using other greases can reduce the interval.

If the compatibility of the lubricant is uncertain, contact ABB.

7. After Sales Support

7.1 Spare parts

When ordering spare parts, the motor serial number, full type designation and product code, as stated on the rating plate, must be specified.

For more information, please visit our web site
www.abb.com/partsonline.

7.2 Rewinding

Rewinding should always be carried out by qualified repair shops.

Smoke venting and other special motors should not be rewound without first contacting ABB.

7.3 Bearings

Special care should be taken with the bearings. These must be removed using pullers and fitted by heating or using special tools for the purpose.

Bearing replacement is described in detail in a separate instruction leaflet available from the ABB Sales Office.

8. Environmental requirements

8.1 Noise levels

Most of ABB's motors have a sound pressure level not exceeding 82 dB(A) at 50 Hz .

Values for specific machines can be found in the relevant product catalogues. At 60 Hz sinusoidal supply the values are approximately 4 dB(A) higher compared to 50 Hz values in product catalogues.

For sound pressure levels at frequency converter supply, please contact ABB.

Sound pressure levels for all machines having separate cooling systems and for series M2F*/M3F*, M2L*/M3L*, M2R*/M3R*, M2BJ/M3BJ and M2LJ/M3LJ are indicated in separate additional manuals.

9. Troubleshooting

These instructions do not cover all details or variations in equipment nor provide for every possible condition to be met in connection with installation, operation or maintenance. Should additional information required, please contact the nearest ABB Sales Office.

Motor troubleshooting chart

Your motor service and any troubleshooting must be handled by qualified persons who have proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating.
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor rating plate and load factor.
	Improper line connections	Check connections against diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections. Also ensure that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator Poor stator coil connection	Indicated by blown fuses. Motor must be rewound. Remove end shields, locate fault.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load.
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult equipment supplier.
	Overload	Reduce load.
	Low voltage	Ensure the rating plate voltage is maintained. Check connection.
	Open circuit	Fuses blown, check overload relay, stator and push buttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to nominal speed	Not applied properly	Consult equipment supplier for proper type.
	Voltage too low at motor terminals because of line drop	Use higher voltage or transformer terminals or reduce load. Check connections. Check conductors for proper size.
	Starting load too high	Check the start load of the motor.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required, as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.

TROUBLE	CAUSE	WHAT TO DO
Motor takes too long to accelerate and/or draws high current	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Make sure that adequate cable size is used.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Correct power supply.
Wrong rotation direction	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running	Overload	Reduce load.
	Frame or ventilation openings may be full of dirt and prevent proper ventilation of motor	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Motor must be rewound
Motor vibrates	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
	Motor misaligned	Realign.
	Weak support	Strengthen base.
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearings.
	Bearings not in line	Repair motor.
	Balancing weights shifted	Rebalance motor.
	Contradiction between balancing of rotor and coupling (half key - full key)	Rebalance coupling or motor.
	Polyphase motor running single phase	Check for open circuit.
Scraping noise	Excessive end play	Adjust bearing or add shim.
	Fan rubbing end shield or fan cover	Correct fan mounting.
Noisy operation	Loose on bedplate	Tighten holding bolts.
	Air gap not uniform	Check and correct end shield fits or bearing fits.
Hot bearings	Rotor unbalance	Rebalance rotor.
	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away from shaft shoulder	Move pulley closer to motor bearing.
	Pulley diameter too small	Use larger pulleys.
	Misalignment	Correct by realignment of the drive.
	Insufficient grease	Maintain proper quality and amount of grease in bearing.
	Deterioration of grease or lubricant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease, bearing should not be more than half full.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Replace bearing, clean housing thoroughly first.

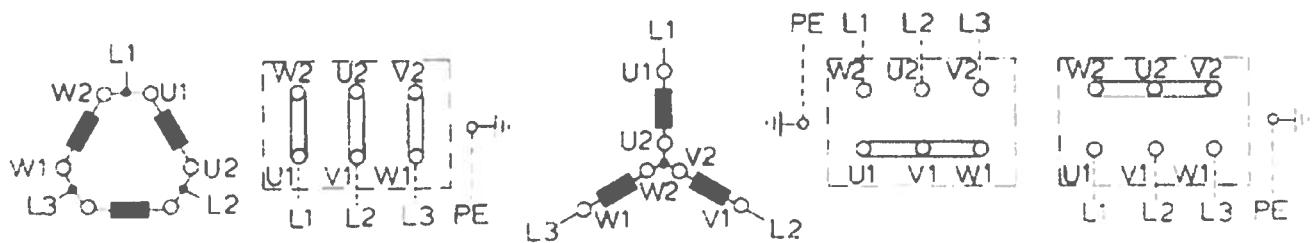


Figure 1. Connection diagram

Bild 1. Anschlußdiagramm

Figure 1. Connection

Figura 1. Conexión

Figura 1. Collegamento

Figura 1. Diagrama de ligações

Figur 1. Anslutningdiagramm

Kuva 1. Kytkentäkaavio

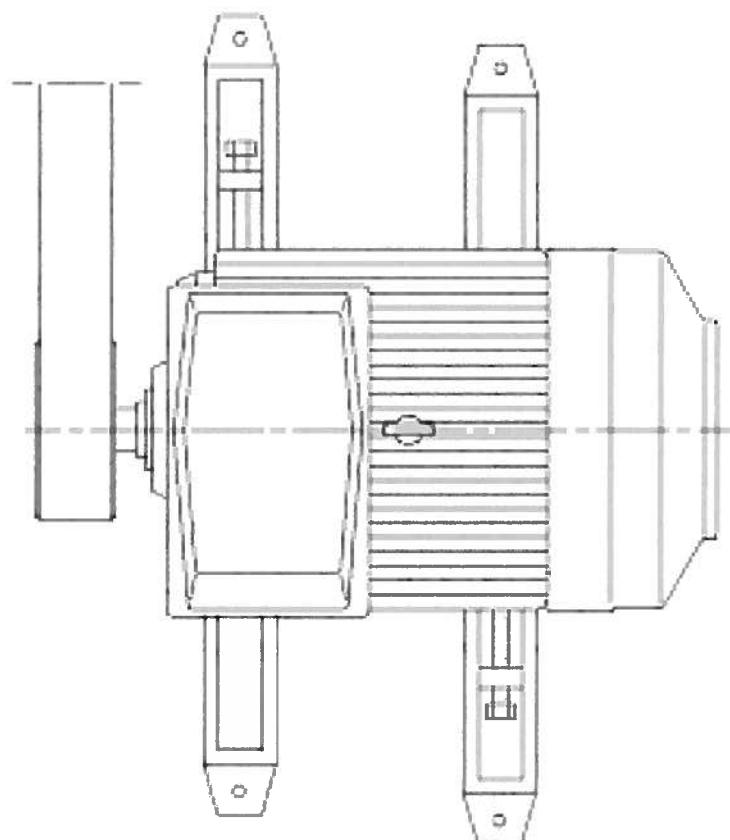


Figure 2. Belt drive

Bild 2. Riementrieb

Figure 2. Glissières et entraînements à courroie

Figure 2. Carriles tensores y correas

Figura 2. Slitte tendicinghia e pulegge

Figura 2. Transmissão por correias

Figur 2. Remdrift

Kuva 2. Hihnakäyttö

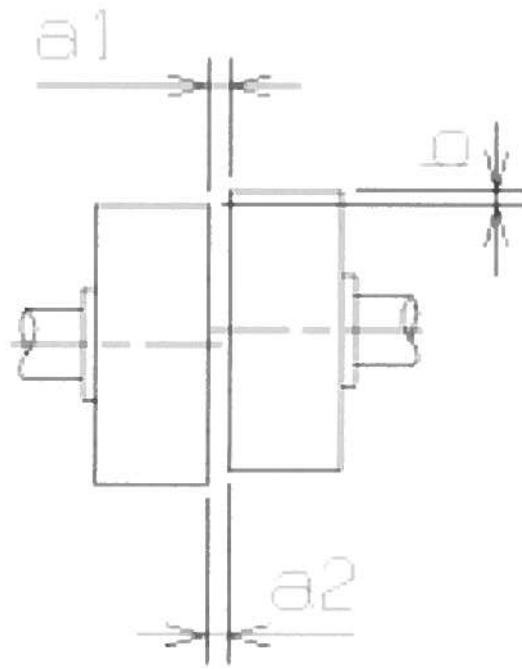


Figure 3. Mounting of half-coupling or pulley

Bild 3. Anbau von Kupplungshälften und Riemscheiben

Figure 3. Montage des demi-accouplements et des poulies

Figura 3. Montaje de mitades de acoplamiento y poleas

Figura 3. Montaggio di semigiunti e pulegge

Figura 3. Montagem de meio acoplamento ou poleia

Figur 3. Montering av kopplinshalvor och drivskivor

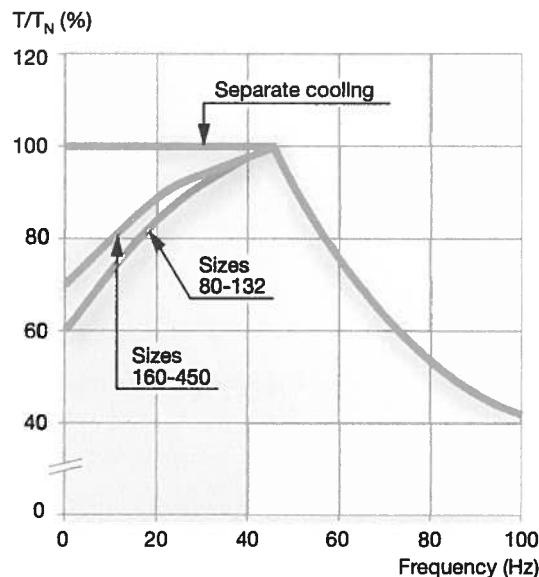
Kuva 3. Kytkinpuolikkaan ja hihnapyörän asennus

Loadability curves with ACS800 converters with DTC control
Belastbarkeitskurven für ACS800-Frequenzumrichter mit DTC-Steuerung
Courbes de capacité de charge avec convertisseurs ACS800 et commande DTC
Curvas de capacidad de carga con convertidores ACS800 dotados de control DTC
Curve di caricabilità con convertitori ACS800 e controllo DTC
Curvas de capacidade de carga com conversores ACS800 com controlo de transmissão digital (DTC)
Lastbarhetskurvor för ACS800-omriktare med DTC-styrning
Kuormitettavuuskäyrät DTC-säädöllä varustetuille ACS800-taajuusmuuttajille

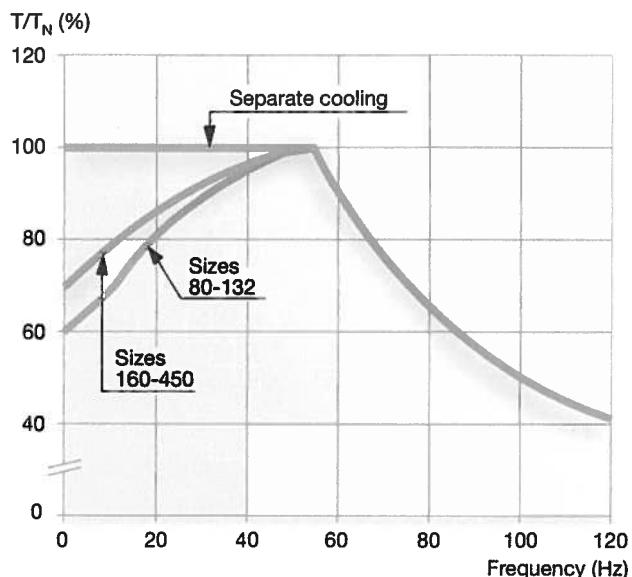
Figures/Abbildungen/Figures/Figure/Figure/Figuras/Figur/Kuvat 4a, 4b, 4c, 4d

Low voltage motors, nominal frequency of the motors 50/60 Hz, temperature rise B/F
 Niederspannungsmotoren, Nennfrequenz der Motoren 50/60 Hz, Temperaturanstieg B/F
 Moteurs à basse tension, fréquence nominale des moteurs de 50/60 Hz, augmentation de température B/F
 Motores de baja tensión, frecuencia nominal de los motores 50/60 Hz, aumento de temperatura B/F
 Motori a bassa tensione, frequenza nominale dei motori 50/60 Hz, incremento di temperatura B/F
 Motores de baixa tensão, frequência nominal dos motores 50/60 Hz, aumento da temperatura B/F
 Lågspänningsmotorer, märkfrekvens för motorerna 50/60 Hz, temperaturstegring B/F
 Pienjännitemoottorit, moottorin nimellistajaajuus 50/60 Hz, lämpötilan nousu B/F

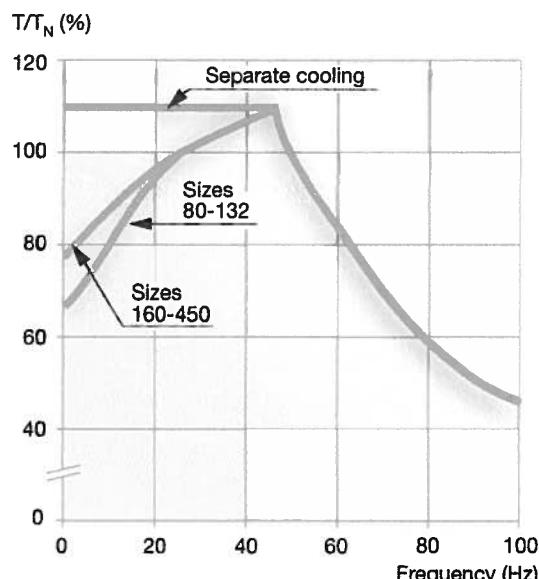
4a ACS800/50 Hz, Temperature rise B



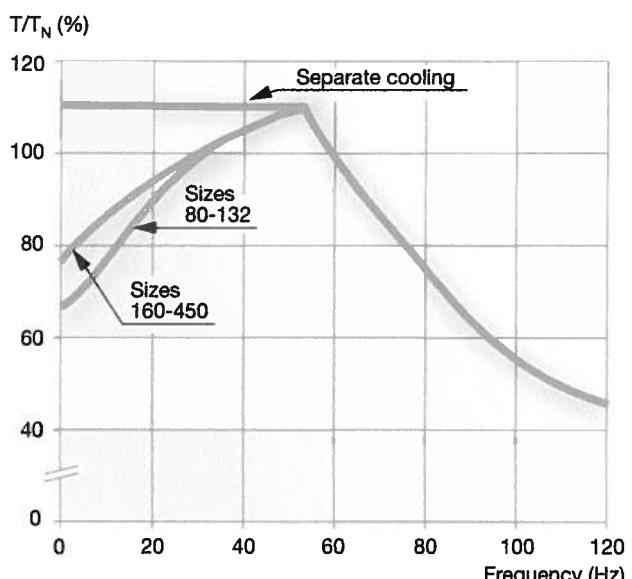
4b ACS800/60 Hz, Temperature rise B



4c ACS800/50 Hz, Temperature rise F



4d ACS800/60 Hz, Temperature rise F



Loadability curves with ACS550 converters

Belastbarkeitskurven für ACS550-Frequenzumrichter

Courbes de capacité de charge avec convertisseurs ACS550

Curvas de capacidad de carga con convertidores ACS550

Curve di caricabilità con convertitori ACS550

Curvas de capacidad de carga com conversores ACS550

Lastbarhetskurvor för ACS550-omriktare

Kuormitettavuuskäyrät ACS550-taajuusmuuttajille

Figures/Abbildungen/Figures/Figure/Figure/Figuras/Figur/Kuvat 5a, 5b, 5c, 5d

Low voltage motors, nominal frequency of the motors 50/60 Hz, temperature rise B/F

Niederspannungsmotoren, Nennfrequenz der Motoren 50/60 Hz, Temperaturanstieg B/F

Moteurs à basse tension, fréquence nominale des moteurs de 50/60 Hz, augmentation de température B/F

Motores de baja tensión, frecuencia nominal de los motores 50/60 Hz, aumento de temperatura B/F

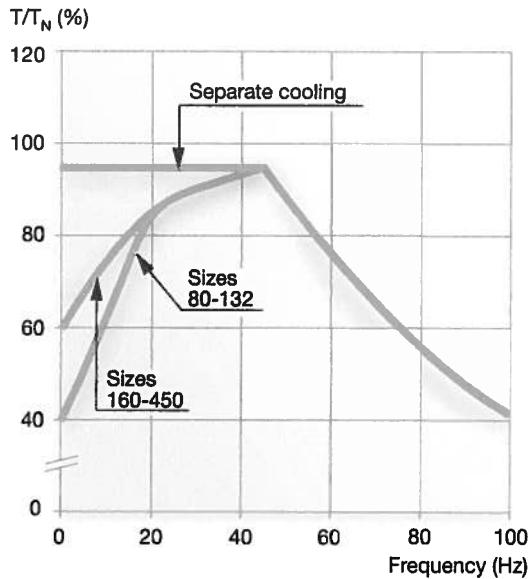
Motori a bassa tensione, frequenza nominale dei motori 50/60 Hz, incremento di temperatura B/F

Motores de baixa tensão, frequência nominal dos motores 50/60 Hz, aumento da temperatura B/F

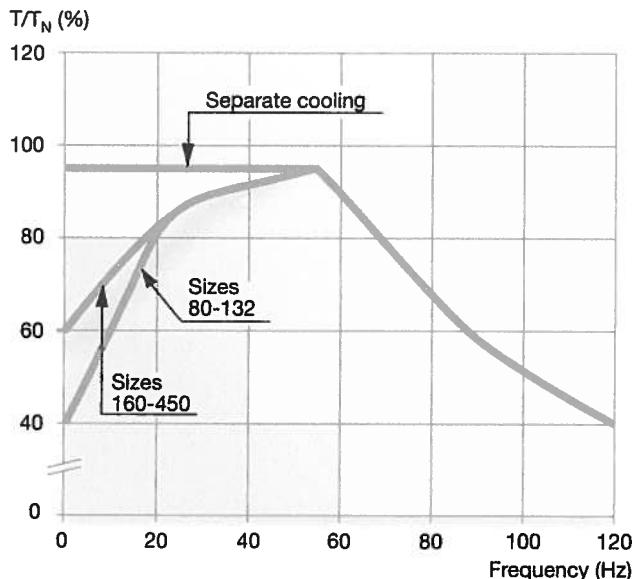
Lågspänningsmotorer, märkfrekvens för motorerna 50/60 Hz, temperaturstegring B/F

Pienjännitemoottorit, moottorin nimellistaaajuus 50/60 Hz, lämpötilan nousu B/F

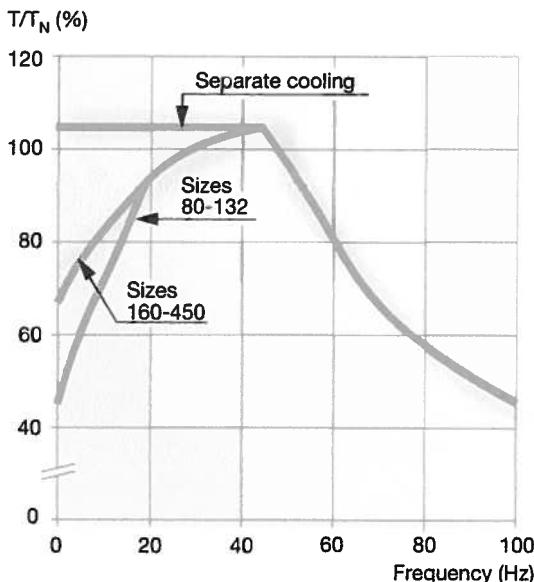
5a ACS550/50 Hz, Temperature rise B



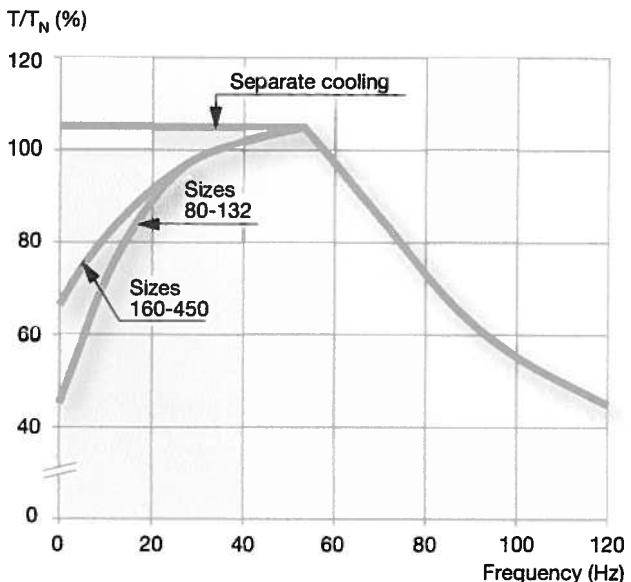
5b ACS550/60 Hz, Temperature rise B



5c ACS550/50 Hz, Temperature rise F



5d ACS550/60 Hz, Temperature rise F



Figure/Bild/Figure/Figura/Figura/Figur/Kuva 6.

Allowed phase to phase voltage peaks at motor terminal as a function of rise time.

..... ABB Special Insulation; ____ ABB Standard Insulation

Zulässige Phase-zu-Phase-Spannungsspitzen an Motorklemmen als Funktion der Anstiegszeit.

..... ABB Spezialisierung; ____ ABB Standardisierung

Pics de tension phase-phase au niveau des bornes du moteur en tant que fonction de temps de hausse.

..... ABB Isolation spéciale ; ____ Isolation standard ABB

Picos de tensión permitidos entre fases en los bornes del motor en función del tiempo de aumento.

..... Aislamiento especial de ABB; ____ Aislamiento estándar de ABB

Picchi di tensione da fase a fase ammessi ai morsetti del motore in funzione del tempo di salita.

..... Isolamento speciale ABB; ____ Isolamento standard ABB

Fase permitida para picos de tensão de fase no terminal do motor como função do tempo de subida.

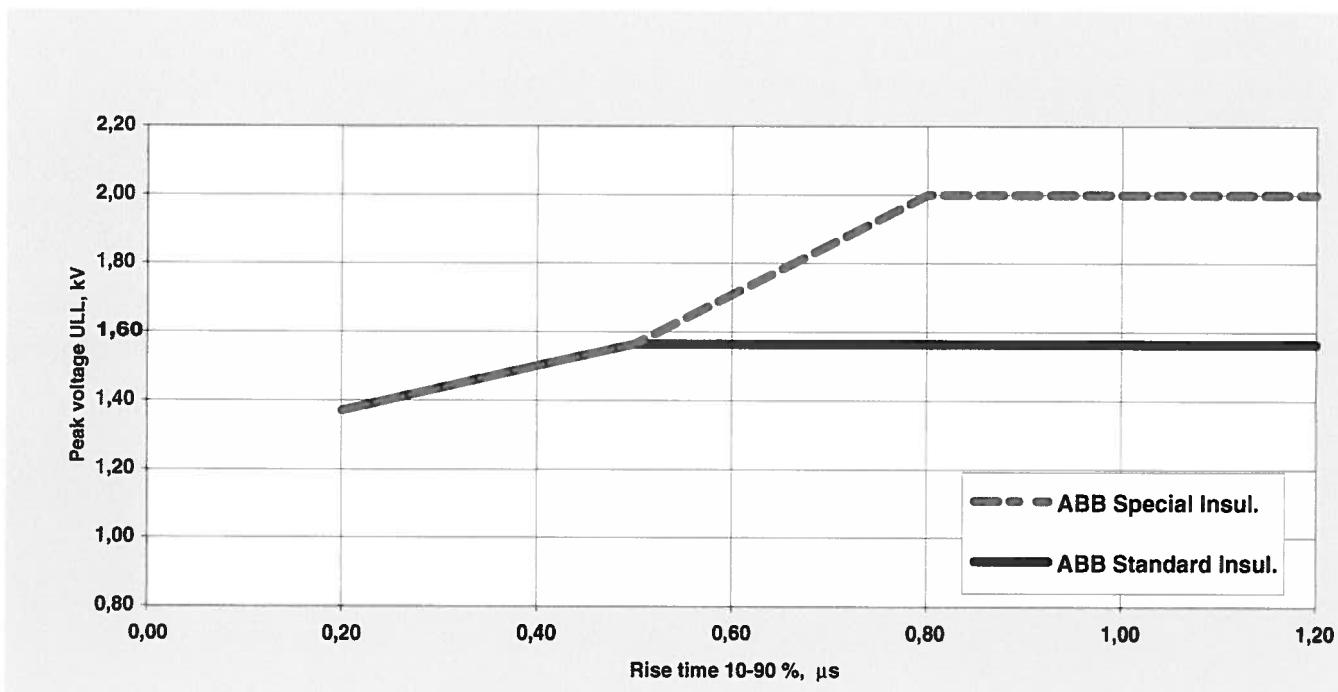
..... Isolamento especial da ABB; ____ Isolamento normal da ABB

Tillåtna fas till fas-spänningstoppar vid motoranslutningarna som en funktion av stigtid.

..... ABB Specialisolering; ____ ABB Standardisolering

Pääjännitteiden suurimmat sallitut piikkiarvot nousunopeuden funktiona.

..... ABB:n erikoiseristys; ____ ABB:n vakioeristys



Contact us

www.abb.com/motors&generators

© Copyright 2010 ABB
All rights reserved
Specifications subject to change without notice.

SAKK104570 ML 01-2009 Rev D, 3GZFF500730-85 Rev D

Power and productivity
for a better world™

