



## **BALANCING CERTIFICATE N. 1567**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 63K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/A</b>
<b>OBJECT</b>	<b>N. 1 IMPELLER TYPE PF 17/8/A</b>

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **BALANCING CERTIFICATE N. 1568**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/B</b>
<b>OBJECT</b>	<b>N. 1 IMPELLER TYPE GPR 19</b>

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **BALANCING CERTIFICATE N. 1569**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K2</b>
<b>OUR CONFIRMATION</b>	<b>85.12/C</b>
<b>OBJECT</b>	<b>N. 1 IMPELLER TYPE GPR 48</b>

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **BALANCING CERTIFICATE N. 1570**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K3</b>
<b>OUR CONFIRMATION</b>	<b>85.12/D</b>
<b>OBJECT</b>	<b>N. 1 IMPELLER TYPE GPH 52</b>

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **BALANCING CERTIFICATE N. 1571**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K4

**OUR CONFIRMATION** 85.12/E

**OBJECT** N. 1 IMPELLER TYPE RB 35

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **BALANCING CERTIFICATE N. 1572**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 65K1

**OUR CONFIRMATION** 85.12/F

**OBJECT** N. 1 IMPELLER TYPE RB 19

The impeller in object is statically and dynamically balanced with electronic equipment in accordance with ISO n. 1940, class Q = 2,5.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**

18 & ALZ France  
d'Ibergues  
30 Ibergues  
ANCE

ausgeführt im Einvernehmen mit dem TÜV-Rheinland -etabli en record avec le TÜV Rheinland auf Gegenzeichnung wird laut Schreiben des TÜV-Rheinland vorzuhalten  
dispon de contre-signature selon lettre du TÜV Rheinland  
Anforderungen: A-D 2000 Markblatt W0/TRD100-W2-W10 conditions imposées  
Werksfertzeichnung Schmelz-Nr. Proba-Nr. Stempel des Werksechovant  
désignation du matériau n. de coulée n. d'échantillon pointeur du contrôleur

Manufacturer's works order number de la commande usine productrice Fertigstellungsnummer	Surveyor's mark Cachet de l'expert Stempel des Werksachverständigen	Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfänger	Purchaser's order number N° de commande client Kundenbestellnummer
IA557900/03-56478/1	UI2	GRUPPO INOX SPA LARGO ESTERLE, 4 20052 MONZA ITALIE	30210 FEBBRAIO
Product - Product - Erzeugnis OLD-ROLLED COIL CORINE LAMINÉE A FROID ALTGEWALZTES BAND		Customer article number N° d'article client Artikelnummer des Kunden	A09
Material designation Signification de l'acier Metallbezeichnung	Plate Präsentation Ausführung	Steelmaking process Mode d'élaboration de l'acier Stahlherstellungsverfahren	Product delivery conditions Etat de livraison du produit Lieferzustand
I 10028-7 / 00 - 1. 4307 4301	2B	Prod. process: Electric arc furnace-VOD/AOD-Continuous casting Prod.fabrik: Four à arc-VOD/AOD-Stahlgußanlage	Settling treated 1000-1100 C
I 1008K-2 / 05 - 1. 4307 4301	2B	Any supplementary requirements Prescriptions supplémentaires Zusätzliche Anforderungen	Hypotropismus Locausgangs-/Abgashaltest:
ITM A 240 / 04 - AISI304L AISI304	2B		Forced Air Air force Gebläse Luft

INITIATION PB3 97/21-N BP-LV-01-MAT-01 DAPAVE DU (17/12/2001)

Identification of the product Identification du produit-Identifizierung des Erzeugnisses		Dimensions Dimensions - Abmessungen			Number of pieces Nombre de pièces - Stückzahl	
U. n. de bobine - Band-Nr	N° de coulée Schmelz-Nr 87462	Thickness Epaisseur - Dicke 2,500 mm	Width Largeur - Breite 1500,00 mm	Length Longueur - Länge	Net weight Poids net - Netto Gewicht	5320 KGS

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG													
	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P	Cu		
Required-Exigé fordern	% min % max	0,030	0,75	2,00	10,00	18,00		0,100	0,0150	0,045			
Cast Analysis Analyse coulée Analyse Schmelze		0,028	0,41	1,58	8,11	18,18		0,086	0,0020	0,028	0,310		

Is to verify batch and quality have been carried out - OK  
Is de vérification de la conformité de la teneur et qualité - OK  
Wechselprüfstellung wurde durchgeführt - OK

MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE													
Room temperature - Température ambiante - Raumtemperatur							Test temperature - Température de test - Temperatur						
Location (1)	Direction (2)	Required Exigé Anforderung	Tensile strength Limit d'élasticité Streckgrenze	Yield strength Résistance à la traction Zugfestigkeit	Elongation after fracture Allongement après rupture Bruchdehnung	Hardness Durée Härte	Yield strength Limit d'élasticité Streckgrenze	Tensile str. Résist. Zugfestigkeit	Yield str. Résist. Zugfestigkeit	Temperatur % Allongement Dehnung			
	Required Exigé Anforderung	Rp 0,2 %	Rp 1 %	Rm	Percent Pourcent %	HRB	Rp 0,2 %	Rp 1 %	Rm				
	min max	220	250	520 870	45 40	92							
T	Obtained Obtenu Ergebnisse	313	380	638	52 52	88							

Impact strength test Essai de résilience Zerschlagsgeschwindigkeitstest	Corrosion test Test de corrosion Korrosionstest
temperature température	EN ISO 3851-2 :OK

Condition of the sample (1)  
placement de l'échantillon  
zu des Prübenahmen

1. Front - Début - Anfang  
2. Back - Fin - Ende  
3. Middle - Milieu - Mitte

Condition of the rest pieces (2)  
entraînement des échantillons  
beurteilung

1. Transverse - Transvers - Quer  
1. Longitudinal - Long - Längs

Internal cleanliness  
Nettoyage intérieur  
Innenreinheit

The delivery is in accordance with the order  
La livraison est conforme aux exigences de la commande  
Die Lieferung entspricht den Bestellbedingungen

Organisation inspection  
Organisme et/ou service contrôle  
Überwachungsanstalt

Service Métallurgique

Le : 10/03/2008 M. THOMAS

The inspector  
Le responsable  
Der Werksechovant

Der Werksechovant

GRUPPO INOX S.P.A.

COPIA CONFORME ALL'ORIGINALE

0112 3302

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Ugine & ALZ France  
Site d'Isbergues  
62330 Isbergues  
FRANCE

A04 MILL CERTIFICATE BS EN 10204/3.1

N-Nr-N 07-I-96633-01-01

CERTIFICAT DE RECEPTION NF EN 10204/3.1  
ABNAHMEPRUEFZEUGNIS B DIN EN 10204/3.1

A03

ausgestellt im Einvernehmen mit dem TÜV-Rheinland -établi en accord avec le TÜV Rheinland auf Gegenzeichnung wird laut Schreiben des TÜV-Rheinland verzichtet  
dispense de contresignature selon lettre du TÜV Rheinland  
Anforderungen: A.D 2000 Merkblatt W0/TRD100- W2- W10 conditions imposées  
Werkstoffbezeichnung Schmelz-Nr. Probe-Nr. Stempel des Werkssachverständigen  
désignation du matériau n.d. coulée n.d. échantillon poinçon du contrôleur

A02

ISO TS 16949V2002 - ISO 14001 V1996

Z05

A01

Manufacturer's works order number  
N° de la commande usine productrice  
Werksauftragsnummer

7UA684295/03-31667/1

A08

Surveyor's mark  
Cachet de l'expert  
Stempel des  
Werkssachverständigen

UI2

Z03

Purchaser and/or consignee  
Client et/ou destinataire  
Besteller und/oder Empfänger

GRUPPO INOX SPA

Purchaser's order number  
N° de commande client  
Kundenbestellnummer

8259 MAGGIO

A07

Product - Produit - Erzeugnis  
COLD-ROLLED COIL  
BOBINE LAMEE A FROID  
KALTGEWALZTES BAND

Steel designation  
Désignation de l'acier  
Stahlbezeichnung

EN 10028-7 / 00 - I. 4307 4301  
EN 10088-2 / 05 - I. 4307 4301  
ASTM A 240 / 04 - AISI304L AISI304

B02

Finish  
Présentation  
Ausführung

UI2

Steelmaking process

Mode d'élaboration de l'acier  
Stahlherstellungsverfahren  
Prod.proc: Electric arc furnace-VOD/AOD-Continuous casting

C70

Proc.fabric.: Four à arc-VOD/AOD-Coulée continue

Fertigungsablauf:Ektro-Ofen-VOD/AOD-Stranggussanlage

2B

Any supplementary requirements

B03

Prescriptions supplémentaires Zusätzliche Anforderungen

B04

Product delivery condition  
Etat de livraison du produit  
Lieferzustand

Solution treated  
Hypertrempe:  
Loesungsgegl+abgeschreckt

Forced Air  
Air forced  
Geblaese Luft

B04

ATTESTATION PRO 97/23-N EP-LY-01-MAT-01 GAPAVE DU 07/12/2001

Z06

Identification of the product Identification du produit-Identifizierung des Erzeugnisses		B07	Dimensions Dimensions - Abmessungen						Number of pieces Nombre de pièces - Stueckzahl		B08
Coil n. N° de bobine	Band Nr	Heat n. N° de coulée	Schmelz Nr	Thickness Epaisseur - Dicke	B09	Width Largeur - Breite	B10	Length Longueur - Laenge	B11	B12	1
79288		207020		3,000 mm		1500,00 mm					

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG

	C	Si	Mn	Ni	Cr	Mo	Tl	N	S	P	Cu								
Required-Exigé Anforderung	% mini % maxi	0,030	0,75	2,00	10,00	19,50			0,100	0,0150	0,045								
Cast Analysis Analyse coulée Analyse Schmelze		0,022	0,40	1,42	8,02	18,17			0,052	0,0018	0,032	0,301							

Tests to verify batch and quality have been carried out : OK

D52

Tests de vérification de la conformité de la nuance fournie : OK

Verwechslungsprüfung wurde durchgeführt : OK

MECHANICAL PROPERTIES - PROPRIÉTÉS MECANIQUES - MECHANISCHE WERTE

C03

Location (1)		Room temperature - Température ambiante - Raumtemperatur						Test temperature :										
Direction (2)	Yield strength Limite d'élasticité Streckgrenze	Tensile strength Résistance à la traction Zugfestigkeit	Elongation after fracture Allongement après rupture Bruchdehnung	Hardness Dureté Härte	Yield strength Limite d'élasticité Streckgrenze	Tensile str. Résist. Mpa Zugfestigkeit	Elongation % Allongement Bruchdehnung	Rm	Rp 0.2 %	Rp 1 %	Rm							
Required Anforderung	Exigé	Rp 0.2 %	Rp 1 %		Rm	5,65	2"	HRB	C30									
mini maxi		220	250		520	45	40											
					670													
1	T	Obtained Obtenu Ergebniss	314	363	652	61	53	-	84									
			C11	C14	C12	C13	C15	C31	C16	C17	C18	C19						
Impact strength test Essai de résilience Kerbschlagzähigkeitstest		Corrosion test Test de corrosion Korrosionstest																
temperature		C44	EN ISO 3651-2	:OK		C50	C51	C52	C53	C54	C55	C56						
		C42		DS1	Internal cleanliness :						A:	B:	C:	D:	C57			

Location of the sample (1)  
Emplacement de l'échantillon  
Lage des Probenabschnitten

- Front - Début - Anfang
- Back - Fin - Ende
- Middle - Milieu - Mitte

Direction of the test pieces (2)  
Orientation des éprouvettes  
Probenrichtung

- Transverse - Travers - Quer  
L. Longitudinal - Long - Laengs

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  
Ueberwachungsabteilung

Service Métallurgique

Le : 21/05/2007

M. THOMAS

The inspector  
Le responsable  
Der Werssachverständige

Z02

Marking, inspection and measurement : without objection

Contrôle de marquage, d'aspect et de dimensions : satisfaisants  
Prüfung der Stempelung, des Oberflächenaspekts und  
der Abmessungen : ohne Beanstandung

D01

900609586000



UGINE & ALZ  
ACELOR GROUP  
UGINE & ALZ Belgium NV  
Maatschappij voor staal  
Gent-Zuid : Zone 5A, Gwinnewijerweg 3, B 3600 Genk  
Tel. (089) 30 21 11 - Telefax (089) 30 23 90  
Telefax 380588 elijns 5  
H.B. Tangeren nr 41.081 - B.T.W. nr BE 481.277.814

A01		MILL CERTIFICATE BS EN 10204/3.1 CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS B DIN EN 10204/3.1		N-N-N 2005K0102732 A02	
		Approved as supplier according to AD2000-WO - TRD 100 standard W.E. 603 certified acc. PED (97/23/EC) by TÜV NÜ 0015		CONFORME ALL'ORIGINALE ACCIAI VENDER S.p.A.	

A01		Surveyor's mark: Cachet du Expert <b>U &amp; A</b>		A02	
Manufacturer's works order number N° de la commande usine productrice Werksauftragsnummer		Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfänger ACCIAI VENDER SPA		Purchaser's order number N° de commande client Kundenauftragsnummer	
500542671/01-07964/199/01 Packing list: 2005KS39821		Stamp des Werksachverständigen		A03	
Product - Produkt - Erzeugnis COILS, NOT COILED, ANNEALED AND PICKLED COILS, LAMEUX A CHAUD, RECUIVRE + DÉCALE COILLE, VERBRENNVOLAT, GEZOIGERT UND SPICKZET		VIA NOSEL 4/A 0.000 IND.LE S.P.T.P. 43100 PARMA ITALIA		Customer article number N° d'article client Artikelnummer des Kunden	
Steel designation Désignation de l'acier Stahlbezeichnung		Plating Präzession Anstrichung		A04	
EN 10020-7/00 WER 1.4387/1.4301 EN 10020-2/05 WER 1.4387/1.4301 ASME A 248 (ME-02A) WPS 3845/3846		Thickness Epaisseur - Dicke		Microstructure process Mode d'habilitation de l'acier - Zählgussverfahren Elektro-Schl.-VOD/VOD-Continuous casting Four à arc-VOD/AOD-Couleuse continuelle Elektro-Ofen-VOD/AOD-Schlampenofen	
		ID		A05	
		ID		Any supplementary requirements Préscriptioins supplémentaires - Zusätzliche Anforderungen	
		NO 1		X2 CRNI 18-9	
				A06	
				Product delivery conditions Etat de livraison du produit Lieferbedingungen	
				Condition treated: Hyper-eutectic: Lösungsgraphitgehalt: Forced air - Air forced Gebunden Graphit	
				A07	
				UF4386 by 1552	

AD 2000 W2/2004 -- AD 2000 W10/2003 -- EN 13445-2/2002

Identification of the product Identification du produit - Identifizierung des Erzeugnisses		Dimensions Dimensions - Abmessungen			Number of pieces Nombre de pièces - Stückzahl		A08
Code n. N° de bâche - Band Nr	Band n. N° de coude - Schmiede Nr	Thickness Epaisseur - Dicke	Width Largeur - Breite	Length Longueur - Länge	Net weight Poids net - Netto Gewicht		1
54303641	543036	4.00 mm	1500.00 mm		8990 kg		

CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSEZUNG											
	C	Si	Mn	Ni	Cr	Mo	Ti	N	S	P	
Required-Dict. Anforderung	% min % max				0.00	18.00					
Cast Analysis Analyses coulées	0.021	0.49	2.49	8.10	18.00			0.100	0.015	0.045	
Analytic Schmelze	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21

Tests to verify batch and quality have been carried out : OK  
Tests de vérification de la conformité de la répasse fournie : OK  
Vermischungsprobe wurde durchgeführt : OK

Mechanical Properties - PROPRIÉTÉS MÉCANIQUES - MECHANISCHE WERTE EN 10002-1		Test Temperature : C22									
Room temperature - Température ambiante - Raumtemperatur											
Direction (1)											
Direction (2)											
Required Anforderung											
Obtained Obtenu Ergebnisse											
C11											

Impact strength test Essai de résilience Kohäsionsprüfung		Corrosion test Test de corrosion Korrosionsprüfung		Rp 0.2 (%) / Rp 1 % EN 10 3651/2 : C24 DIN Internal Classification : C25		50.2 (T) / 51.0 45		Rp 0.2 % / Rp 1 % C26 C27 C28 C29 C30		Sample Weight 3.97mm C31 C32	

Location of the sample (1) Emplacement de l'échantillon Lage des Probenstückes		The delivery is in accordance with the order La livraison est conforme aux exigences de la commande Die Lieferung entspricht den Bestellbedingungen		A09		Organization inspection Organisation des services contrôles Überwachungsabteilung		Metallurgical Department 24/11/2005 J. VANTRAPPEN		A10	
Orientation of the test pieces (2) Orientation des épreuves Probierrichtung		Marking, Inspection and measurement : without objection Contrôle de marquage, d'essai et de dimension : sans objection Prüfung der Markierung, des Oberflächenaussehen und der Abmessungen : ohne Einwände		D11		The Inspector Le responsable Der Werkstachverständige		Signature		D12	
C20		C21		C22		C23		C24		C25	

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GRUPPO INOX S.P.A.**

0057 5959

ACERINOX,S.A.  
FABRICA DEL CAMPO  
DE GIBRALTAR  
PALMONES (LOS BARRIOS)  
TFNO.(34)-56-629300  
FAX (34)-56-629311  
P.O. BOX.83  
11370 LOS BARRIOS (CADCIZ)



# INSPECTION CERTIFICATE CERTIFICADO DE INSPECCION

3.1.8

ACCORDING TO EN 10204  
SEGUN

CERTIFICATE N°  
CERTIFICADO N° 200862 2 / 1

CUSTOMER  
CLIENTE

GUIDETTI INOX SRL  
VIA ROMA, 174  
20024 GARBAGNATE MIL

REQUERIMIENTOS  
NORMAS APLICABLES

TRADE MARK  
SELLO DEL FABRICANTE



INSPECTOR'S STAMP  
SELLO DEL INSPECTOR

Our order no.  
n/pedido SN 21487

Your order no.  
s/pedido 8099

GRADE  
MATERIAL  
ACX 120  
Aisi 304 FINISH  
ACABADO 2B

STEELMAKING PROCESS  
PROCESO DE ACERIA

A.O.D.

CONTENT CONTENIDO	COIL/BOX BOBINA/CAJA	DIMENSIONS DIMENSIONES			MARKS MARCA	QUANTITY Nº PIEZAS	PROBETA
		THICKNESS ESPESOR	WIDTH ANCHO	LENGTH LARGO			
C61288	056T57 A	5,00	1.000,00	2.000,00	6	20	056T57
C61307	056T57 A	5,00	1.000,00	2.000,00	7	18	056T57

## CHEMICAL ANALYSIS COMPOSICION QUIMICA (%)

HEAT NO. COLADA	C	CR	MN	NI	P	S	SI					
REQUIREMENTS REQUISITOS		18,000		8,000								
	0,080	20,000	2,000	10,500	0,045	0,030	1,000					

6T57 0,051 18,082 1,760 8,144 0,032 0,007 0,348

## MECHANICAL PROPERTIES CARACTERISTICAS MECANICAS

COIL PROBETA	TYPE TIPO	Rm. N/MM2	Rp 0.2 N/MM2	A50 %	HRB							
REQUIREMENTS REQUISITOS												
056T57	CT	634,3	329,5	52,7	88,0							

INTERGRANULAR CORROSION TEST  
CORROSION INTERGRANULAR TEST

SURFACE AND DIMENSIONAL CONTROL  
INSPECCION SUPERFICIAL Y DIMENSIONAL

REMARKS OBSERVACIONES

SATISFACTORY  
Satisfactoria

WORK INSPECTOR /  
INSPECTOR J.A. SIMON

PALMONES, 15 MARZO

2000


**MARCEGAGLIA S.p.A.**

Sede legale ed amministrativa: via Bracciali, 18 - 46040 Gazzola degli Ippoliti - Mantova - Italy  
 Tel. +39 0370 886 1 Fax +39 0370 886 800 [www.marcegaglia.com](http://www.marcegaglia.com)  
 Stabilimento di Forlì: via Mefal, 20 - 47007 Forlimpopoli - Forlì-Cesena - Italy  
 Tel. +39 0543 470 111 Fax +39 0543 470 105

Certificato di Collaudo  
 Test certificate  
 Abnahmeprotokoll  
 Certificat de contrôle  
 EN 10204 3.1B

Data 26/01/2005  
 Date  
 Datum  
 Date

Nr  
 2536

Cliente GRUPPO INOX SRL Customer Kunde Client		Ordine Cliente Customer's Order Bestellung Commande du Client	Ordine Marcegaglia M2 Order Unsere Auftragbestätigung Notre confirmation de commande
Tipo di Acciaio Steel type Werksstof Naturste stier 304 TP 304 1.4301 Z7 CN 18-09	Norma di collaudo Test specification Prüfungsnormen Specification	EN 10088-2	Tolleranza Tolerance Toleranzen Tolérances

Piatto Cesolato Flat Bars / Flach stahl / Plaats									Composizione Chimica Chemical Analysis / Chemische Analyse / Composition Chimique								
Pos Nr	Dimensioni Abmessungen Dimensions (mm)	Quantità Quantity Menge (m)	Peso Peso Gewicht Poids (Kg)	Pezzi Pieces Stückzahlen Pièces (N)	Stato di Fornitura Condition Supply Lieferstatus Etat de commande	Fabbricazione Coll Steel maker Fabrik Fabricant	Codice Heat Schmelze Code Nr	C (%)	Mo (%)	Si (%)	P (%)	Cr (%)	Ni (%)	Mo (%)	Ti (%)	Co (%)	N (%)
1	25 x 5,0		1.003,0	2			568112	0,038	1,03	0,32	0,028	0,007	18,05	5,04			0,031
2	40 x 5,0		535,0	1			474885	0,039	1,11	0,37	0,028	0,010	18,17	5,50			0,048
3	40 x 5,0		1.650,0	3			568527	0,038	1,04	0,30	0,028	0,008	18,09	5,03			0,050
4	50 x 5,0		1.810,0	3			558235	0,035	1,02	0,37	0,025	0,010	18,06	5,52			0,052

Carico di Sforzamento 8,2% R <sub>0,2</sub> Yield Strength Grenze Limit d'élongation (Mpa)	Carico di Sforzamento 1,9% R <sub>u</sub> Yield Strength Distruggente Limit endurante (Mpa)	Carico di Rottura R <sub>u</sub> Tensile Strength Zugfestigkeit Resistance nominale (Mpa)	Allungamento a rottura A <sub>u</sub> Elongation Dehnung Allongement (%)	Durezza HRC Rockwell Härte Härte
Valori richiesti Required values Anforderungen Valeurs demandées	>=185	>=230	>=500 <=700	>=40
				<=92
Pos Nr	1	275	306	50
	2	278	311	51
	3	279	312	50
	4	270	296	51
				76
				78
				78
				76

Prove di trazione secondo Tensile test according to Zugversuch gemäß Essai de traction en accordance avec	Prova di corrosione intercristallina secondo Intergranular corrosive test according to Prüfung auf interkristalline Korrosion gemäß Essai de corrosion intergranulaire en accordance avec	Controllo visivo e dimensionale Visual and dimensional control Sicht- und Abmessungs kontrolle Contrôle visuel et dimensionnel OK
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Osservazioni	
THE CHEMICAL COMPOSITION REFERS TO THE RAW MATERIAL USED.	



Avviso di specificazione Übereignung nach Voraussetzung Act d'expédition	250251	Nel certificarmi che il prodotto fornito è conforme ai requisiti dell'ordinazione We certify that material supplied complies with the requirements agreed on order Es wird bestätigt, dass die Lieferung den Voraussetzungen bei der Lieferabnahme entspricht Nous certifions que le produit fourni est conforme à la qualité de la commande	Mod. 002 Rev.B4 002002	Marcoaglia S.p.A. Quality Assurance Department
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0051 0646

# DUNAFERR

## CONFORMITY STATEMENT OF PRODUCER

ISO 9001  
Page 1 (2)

A01 Producer's Plant: ISO DUNAFERR CO. LTD., H-2100 GARNAVAROS, VASMI TÉR 1-4.	A02 Type of statement: 22 EN 1204-2014	B16 Vessel: 2018.06.03	A18 Delivery date: 2018.06.05	A11 Date of issue: 2018.06.05	A03 Order No./Ref: 001402021200000001	A03 Statement No.: 001702120000002
A04 Name of customer: Address of customer: Italy, 16122, GENOVA, SALITA SANTA CATERINA 108 A	A05 Name of producer: EURONORD SP. Z O.O. 50-068 GŁÓWICA TUTTO OBIEDZ 23	A06 Place of manufacture: EURONORD SP. Z O.O. 50-068 GŁÓWICA TUTTO OBIEDZ 23	A07 Comments No.: 001402021200000002	A08 Quality marking: SASIPAC	A09 Quality limit: DIN EN 1046-2	
		B01 Name of product:  Hot rolled coil (Plate)				
		B02 2 Dimensional limit: EN 10025-1 B03 Class: 1 C05 Area of Production: Directive of establishment and calibration laboratories Astrakhan plant mark No. 50-A-T-5-(121700) and DAB-EU-348-00 B04 Delivery form of the product: Territory/Statistical				

### IDENTIFICATION OF THE PRODUCT

B17.1 CARTON No.	C10 LOT	C10 Serial Production	B11 Serial No.	B12 Manufacture Date	B13 Actual weight	B14 Coiling date	B15 Width (mm)	B16 Thickness (mm)	B17 Length (mm)	B18 Total mass (t)
620544	UD	8000002462	247025000		22,760		1500	5,00		22,760

B003 Marking of the product

(C54)

EURNORD

CHEMICAL INSPECTION																ASTM statement No.: 032702116/0607		Specification No.								
C1-C6	C7-C10	C11-C14	C15-C18	C19-C22	C23-C26	C27-C30	C31-C34	C35-C38	C39-C42	C43-C46	C47-C50	C51-C54	C55-C58	C59-C62	C63-C66	C67-C70	C71-C74	C75-C78	C79-C82	C83-C86	C87-C90	C91-C94	C95-C98	C99-C102	C103-C106	
C	Mn	Si	S	P	N	Al	Cu	Cr	Ni	V	Nb	Ti	B	Cu	Mo	O	Zr	Al	Sn	W	Co	Cr	Ca	Cr	Ca	
Standard requirement min.:																										
Standard requirement max.:																										
Contract requirement min.:	0.129	1.500	0.500	0.020	0.025	0.015																				
Contract requirement max.:																										
Change chemistry	625953	0.065	0.653	0.014	0.007	0.011	0.008	0.003	0.057	0.054	0.050	0.021	0.028	0.007	0.013	0.004	0.004	0.005	0.001	0.001					0.184	

MECHANICAL INSPECTION	TENSILE TEST												BENDING TEST						IMPACT TEST								
	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37
Standard requirement min.:																											
Standard requirement max.:																											
SAMPLE (N°)	80000460249	20267016459	3	3	1	REH	355	450	A5	23																	

Code according to EN 10168-2004

C10 Shape tolerance: The sample is a quadruple cross-section taken from sheet in every case.  
C01 Length tolerance: 0 = deviation of end; 1 = end of coil; 2 = width of coil; 3 = coil;

C02 Deviation of length: 1 = 1 % elongation; 4-10 = 0.001%; 3 = 2 % diagonal  
C03 Ratio of sample: 1 = reduced; 2 = normalised; 3 = normalized

C04 Marking and identification, surface properties, shape and dimension properties:

Marking and identification, control of surface properties, form and measure properties are completed, the product complies with the contract requirements.

I.051 Supplementary Information:  
I.051.1 The product complies with the contract requirements.

I.052 Supplementary Information:  
I.052.1 We verify that the produced and delivered products don't increase the radioactivity in environment, the radioactivity is under the normativation of 100 Bq/kg.

**EURNORDIC**

202 Sample of Inspection/Verification  
(original) expert

R  
AOS2 Verabschiedung

ISD DUNAFERR-Zrt.  
Minőségügyi és Könyvvizsgálószék (forgalmi)  
Minőségtitkosság  
Kerepesi út 16.

JTS  
János Tóth

L. ORIONALZ  
SOMO

A6



RVA STAB. DI TARANTO VIA APPIA 557 70058

EN 10204 TIPO 3.1

RVS REGISTRE DOCUMENTO - REGULATOR DOCUMENT

COMITATO TECNICO - TECHNICAL COMMITTEE

C1

C2

C3

C4

AD6 DOCUMENTO N.

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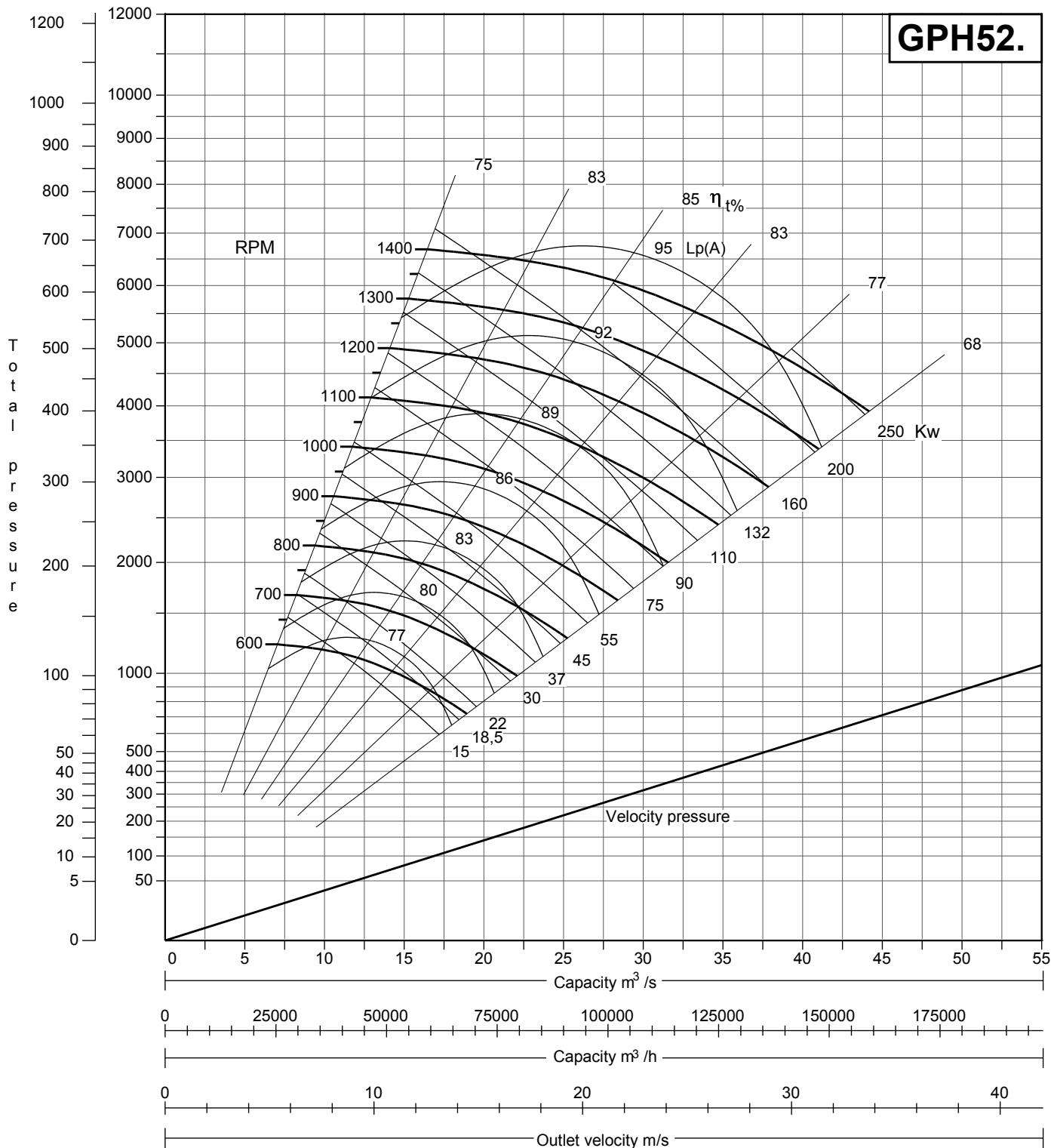


A01 ILIA SPA - VIALE CERTOSA, 249 - 20151 MILANO E SOGGETTA ALL'ATTIVITÀ DI DIREZIONE E COORDINAMENTO DI RIVA FIRE S.P.A.	A04 AD2 TIPO DOCUMENTO - TYPE DOCUMENT CERTIFICATO DI ANALISI CHIMICA DI COLATA CHIMICAL ANALYSIS CERTIFICATE	A03 N. DOCUMENTO DOCUMENT N 2005/047986/01	A02 DATA - DATE 1 202 DATA - DATE 1 25/07/2005	CONFORME COMPLIES	ADM COMMITTENTE - CUSTOMER SICURATE S.p.A. VIA MARGOLADA, 10 20105 CUSANO MILANINO MI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
VA STAB. DI TASANTO VIA APPIA 557 200648 CUSTOMER ORDER €287 - 5,7	AD3 ARTICOLO CLIENTE CUSTOMER ARTICLE B01 PRODOTTO - PRODUCT LAMIERE DERIVATE A CALDO BN 1025 + A11993 B225JTR	A05 N. LOTTO ITEM B9217631	B06 SPESSEZZA - THICKNESS MM 1 INCH	B10 LARGHEZZA - WIDTH MM 1 INCH	B11 LUNGHEZZA - LENGTH MM 1 INCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
AD4 ORGANIZZAZIONE COMMITTENTE CUSTOMER ORDER €287 - 5,7	AD5 ARTICOLO CONFERMA ORDER WORK B02 QUALITY - STEEL GRADE BN 1025 + A11993	A07 N. LOTTO ITEM B9217631	B08 ESENZIE SUPPLEMENTARI-SUPPLEMENTARY REQUIREMENTS 1500,0	B09 STATE DI FORNITURA - DELIVERY CONDITIONS B05 TRATTAMENTO SAGGI - TREATMENT SAMPLES RECORDO INFORMATICO																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
<table border="1"> <thead> <tr> <th colspan="12">COMPOSIZIONE CHIMICA - CHEMICAL COMPOSITION</th> <th colspan="12">PROVE MECANICHE E TECNOLOGICHE - MECHANICAL AND TECHNICAL TESTS</th> </tr> <tr> <th colspan="6">C70 : PROCESSO ELABORAZIONE ACCIAIO - STEEL MANUFACTURING PROCESS</th> <th colspan="6">C71 : COLATA CONTINUA - CONTINUOUS CASTING</th> <th colspan="6">C72 : PROVA DI TRASSIONE - TENSILE TEST</th> <th colspan="6">C73 : PROVA DI IMPACTO - IMPACT TEST</th> </tr> <tr> <th>IDENTIFICAZIONE PRODOTTO IDENTIFICATION PRODUCT</th> <th>MASSA TEORICA THEORETIC MASS KG.</th> <th>IDENTIF. 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C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100	C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306	C307	C308	C309	C310	C311	C312	C313	C314	C315	C316	C317	C318	C319	C320	C321	C322	C323	C324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C339	C340	C341	C342	C343	C344	C345	C346	C347	C348	C349	C350	C351	C352	C353	C354	C355	C356	C357	C358	C359	C360	C361	C362	C363	C364	C365	C366	C367	C368	C369	C370	C371	C372	C373	C374	C375	C376	C377	C378	C379	C380	C381	C382	C383	C384	C385	C386	C387	C388	C389	C390	C391	C392	C393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	C404	C405	C406	C407	C408	C409	C410	C411	C412	C413	C414	C415	C416	C417	C418	C419	C420	C421	C422	C423	C424	C425	C426	C427	C428	C429	C430	C431	C432	C433	C434	C435	C436	C437	C438	C439	C440	C441	C442	C443	C444	C445	C446	C447	C448	C449	C450	C451	C452	C453	C454	C455	C456	C457	C458	C459	C460	C461	C462	C463	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	C476	C477	C478	C479	C480	C481	C482	C483	C484	C485	C486	C487	C488	C489	C490	C491	C492	C493	C494	C495	C496	C497	C498	C499	C500	C501	C502	C503	C504	C505	C506	C507	C508	C509	C510	C511	C512	C513	C514	C515	C516	C517	C518	C519	C520	C521	C522	C523	C524	C525	C526	C527	C528	C529	C530	C531	C532	C533	C534	C535	C536	C537	C538	C539	C540	C541	C542	C543	C544	C545	C546	C547	C548	C549	C550	C551	C552	C553	C554	C555	C556	C557	C558	C559	C560	C561	C562	C563	C564	C565	C566	C567	C568	C569	C570	C571	C572	C573	C574	C575	C576	C577	C578	C579	C580	C581	C582	C583	C584	C585	C586	C587	C588	C589	C590	C591	C592	C593	C594	C595	C596	C597	C598	C599	C600	C601	C602	C603	C604	C605	C606	C607	C608	C609	C610	C611	C612	C613	C614	C615	C616	C617	C618	C619	C620	C621	C622	C623	C624	C625	C626	C627	C628	C629	C630	C631	C632	C633	C634	C635	C636	C637	C638	C639	C640	C641	C642	C643	C644	C645	C646	C647	C648	C649	C650	C651	C652	C653	C654	C655	C656	C657	C658	C659	C660	C661	C662	C663	C664	C665	C666	C667	C668	C669	C670	C671	C672	C673	C674	C675	C676	C677	C678	C679	C680	C681	C682	C683	C684	C685	C686	C687	C688	C689	C690	C691	C692	C693	C694	C695	C696	C697	C698	C699	C700	C701	C702	C703	C704	C705	C706	C707	C708	C709	C710	C711	C712	C713	C714	C715	C716	C717	C718	C719	C720	C721	C722	C723	C724	C725	C726	C727	C728	C729	C730	C731	C732	C733	C734	C735	C736	C737	C738	C739	C740	C741	C742	C743	C744	C745	C746	C747	C748	C749	C750	C751	C752	C753	C754	C755	C756	C757	C758	C759	C760	C761	C762	C763	C764	C765	C766	C767	C768	C769	C770	C771	C772	C773	C774	C775	C776	C777	C778	C779	C780	C781	C782	C783	C784	C785	C786	C787	C788	C789	C790	C791	C792	C793	C794	C795	C796	C797	C798	C799	C800	C801	C802	C803	C804	C805	C806	C807	C808	C809	C8010	C8011	C8012	C8013	C8014	C8015	C8016	C8017	C8018	C8019	C8020	C8021	C8022	C8023	C8024	C8025	C8026	C8027	C8028	C8029	C8030	C8031	C8032	C8033	C8034	C8035	C8036	C8037	C8038	C8039	C8040	C8041	C8042	C8043	C8044	C8045	C8046	C8047	C8048	C8049	C8050	C8051	C8052	C8053	C8054	C8055	C8056	C8057	C8058	C8059	C8060	C8061	C8062	C8063	C8064	C8065	C8066	C8067	C8068	C8069	C8070	C8071	C8072	C8073	C8074	C8075	C8076	C8077	C8078	C8079	C8080	C8081	C8082	C8083	C8084	C8085	C8086	C8087	C8088	C8089	C8090	C8091	C8092	C8093	C8094	C8095	C8096	C8097	C8098	C8099	C80100	C80101	C80102	C80103	C80104	C80105	C80106	C80107	C80108	C80109	C80110	C80111	C80112	C80113	C80114	C80115	C80116	C80117	C80118	C80119	C80120	C80121	C80122	C80123	C80124	C80125	C80126	C80127	C80128	C80129	C80130	C80131	C80132	C80133	C80134	C80135	C80136	C80137	C80138	C80139	C80140	C80141	C80142	C80143	C80144	C80145	C80146	C80147	C80148	C80149	C80150	C80151	C80152	C80153	C80154	C80155	C80156	C80157	C80158	C80159	C80160	C80161	C80162	C80163	C80164	C80165	C80166	C80167	C80168	C80169	C80170	C80171	C80172	C80173	C80174	C80175	C80176	C80177	C80178	C80179	C80180	C80181	C80182	C80183	C80184	C80185	C80186	C80187	C80188	C80189	C80190	C80191	C80192	C80193	C80194	C80195	C80196	C80197	C80198	C80199	C80200	C80201	C80202	C80203	C80204	C80205	C80206	C80207	C80208	C80209	C80210	C80211	C80212	C80213	C80214	C80215	C80216	C80217	C80218	C80219	C80220	C80221	C80222	C80223	C80224	C80225	C80226	C80227	C80228	C80229	C80230	C80231	C80232	C80233	C80234	C80235	C80236	C80237	C80238	C80239	C80240	C80241	C80242	C80243	C80244	C80245	C80246	C80247	C80248	C80249	C80250	C80251	C80252	C80253	C80254	C80255	C80256	C80257	C80258	C80259	C80260	C80261	C80262	C80263	C80264	C80265	C80266	C80267	C80268	C80269	C80270	C80271	C80272	C80273	C80274	C80275	C80276	C80277	C80278	C80279	C80280	C80281	C80282	C80283	C80284	C80285	C80286	C80287	C80288	C80289	C80290	C80291	C80292	C80293	C80294	C80295	C80296	C80297	C80298	C80299	C80300	C80301	C80302	C80303	C80304	C80305	C80306	C80307	C80308	C80309	C80310	C80311	C80312	C80313	C80314	C80315	C80316	C80317	C80318	C80319	C80320	C80321	C80322	C80323	C80324	C80325	C80326	C80327	C80328	C80329	C80330	C80331	C80332	C80333	C80334	C80335	C80336	C80337	C80338	C80339	C80340	C80341	C80342	C80343	C80344	C80345	C80346	C80347	C80348	C80349	C80350	C80351	C80352	C80353	C80354	C80355	C80356	C80357	C80358	C80359	C80360	C80361	C80362	C80363	C80364	C80365	C80366	C80367	C80368	C80369	C80370	C80371	C80372	C80373	C80374	C80375	C80376	C80377	C80378	C80379	C80380	C80381	C80382	C80383	C80384	C80385	C80386	C80387	C80388	C80389	C80390	C80391	C80392	C80393	C80394	C80395	C80396	C80397	C80398	C80399	C80400	C80401	C80402	C80403	C80404	C80405	C80406	C80407	C80408	C80409	C80410	C80411	C80412	C80413	C80414	C80415	C80416	C80417	C80418	C80419	C80420	C80421	C80422	C80423	C80424	C80425	C80426	C80427	C80428	C80429	C80430	C80431	C80432	C80433	C80434	C80435	C80436	C80437	C80438	C80439	C80440	C80441	C80442	C80443	C80444	C80445	C80446	C80447	C80448	C80449	C80450	C80451	C80452	C80453	C80454	C80455	C80456	C80457</th
COMPOSIZIONE CHIMICA - CHEMICAL COMPOSITION												PROVE MECANICHE E TECNOLOGICHE - MECHANICAL AND TECHNICAL TESTS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
C70 : PROCESSO ELABORAZIONE ACCIAIO - STEEL MANUFACTURING PROCESS						C71 : COLATA CONTINUA - CONTINUOUS CASTING						C72 : PROVA DI TRASSIONE - TENSILE TEST						C73 : PROVA DI IMPACTO - IMPACT TEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
IDENTIFICAZIONE PRODOTTO IDENTIFICATION PRODUCT	MASSA TEORICA THEORETIC MASS KG.	IDENTIF. IC C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100	C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306	C307	C308	C309	C310	C311	C312	C313	C314	C315	C316	C317	C318	C319	C320	C321	C322	C323	C324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C339	C340	C341	C342	C343	C344	C345	C346	C347	C348	C349	C350	C351	C352	C353	C354	C355	C356	C357	C358	C359	C360	C361	C362	C363	C364	C365	C366	C367	C368	C369	C370	C371	C372	C373	C374	C375	C376	C377	C378	C379	C380	C381	C382	C383	C384	C385	C386	C387	C388	C389	C390	C391	C392	C393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	C404	C405	C406	C407	C408	C409	C410	C411	C412	C413	C414	C415	C416	C417	C418	C419	C420	C421	C422	C423	C424	C425	C426	C427	C428	C429	C430	C431	C432	C433	C434	C435	C436	C437	C438	C439	C440	C441	C442	C443	C444	C445	C446	C447	C448	C449	C450	C451	C452	C453	C454	C455	C456	C457	C458	C459	C460	C461	C462	C463	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	C476	C477	C478	C479	C480	C481	C482	C483	C484	C485	C486	C487	C488	C489	C490	C491	C492	C493	C494	C495	C496	C497	C498	C499	C500	C501	C502	C503	C504	C505	C506	C507	C508	C509	C510	C511	C512	C513	C514	C515	C516	C517	C518	C519	C520	C521	C522	C523	C524	C525	C526	C527	C528	C529	C530	C531	C532	C533	C534	C535	C536	C537	C538	C539	C540	C541	C542	C543	C544	C545	C546	C547	C548	C549	C550	C551	C552	C553	C554	C555	C556	C557	C558	C559	C560	C561	C562	C563	C564	C565	C566	C567	C568	C569	C570	C571	C572	C573	C574	C575	C576	C577	C578	C579	C580	C581	C582	C583	C584	C585	C586	C587	C588	C589	C590	C591	C592	C593	C594	C595	C596	C597	C598	C599	C600	C601	C602	C603	C604	C605	C606	C607	C608	C609	C610	C611	C612	C613	C614	C615	C616	C617	C618	C619	C620	C621	C622	C623	C624	C625	C626	C627	C628	C629	C630	C631	C632	C633	C634	C635	C636	C637	C638	C639	C640	C641	C642	C643	C644	C645	C646	C647	C648	C649	C650	C651	C652	C653	C654	C655	C656	C657	C658	C659	C660	C661	C662	C663	C664	C665	C666	C667	C668	C669	C670	C671	C672	C673	C674	C675	C676	C677	C678	C679	C680	C681	C682	C683	C684	C685	C686	C687	C688	C689	C690	C691	C692	C693	C694	C695	C696	C697	C698	C699	C700	C701	C702	C703	C704	C705	C706	C707	C708	C709	C710	C711	C712	C713	C714	C715	C716	C717	C718	C719	C720	C721	C722	C723	C724	C725	C726	C727	C728	C729	C730	C731	C732	C733	C734	C735	C736	C737	C738	C739	C740	C741	C742	C743	C744	C745	C746	C747	C748	C749	C750	C751	C752	C753	C754	C755	C756	C757	C758	C759	C760	C761	C762	C763	C764	C765	C766	C767	C768	C769	C770	C771	C772	C773	C774	C775	C776	C777	C778	C779	C780	C781	C782	C783	C784	C785	C786	C787	C788	C789	C790	C791	C792	C793	C794	C795	C796	C797	C798	C799	C800	C801	C802	C803	C804	C805	C806	C807	C808	C809	C8010	C8011	C8012	C8013	C8014	C8015	C8016	C8017	C8018	C8019	C8020	C8021	C8022	C8023	C8024	C8025	C8026	C8027	C8028	C8029	C8030	C8031	C8032	C8033	C8034	C8035	C8036	C8037	C8038	C8039	C8040	C8041	C8042	C8043	C8044	C8045	C8046	C8047	C8048	C8049	C8050	C8051	C8052	C8053	C8054	C8055	C8056	C8057	C8058	C8059	C8060	C8061	C8062	C8063	C8064	C8065	C8066	C8067	C8068	C8069	C8070	C8071	C8072	C8073	C8074	C8075	C8076	C8077	C8078	C8079	C8080	C8081	C8082	C8083	C8084	C8085	C8086	C8087	C8088	C8089	C8090	C8091	C8092	C8093	C8094	C8095	C8096	C8097	C8098	C8099	C80100	C80101	C80102	C80103	C80104	C80105	C80106	C80107	C80108	C80109	C80110	C80111	C80112	C80113	C80114	C80115	C80116	C80117	C80118	C80119	C80120	C80121	C80122	C80123	C80124	C80125	C80126	C80127	C80128	C80129	C80130	C80131	C80132	C80133	C80134	C80135	C80136	C80137	C80138	C80139	C80140	C80141	C80142	C80143	C80144	C80145	C80146	C80147	C80148	C80149	C80150	C80151	C80152	C80153	C80154	C80155	C80156	C80157	C80158	C80159	C80160	C80161	C80162	C80163	C80164	C80165	C80166	C80167	C80168	C80169	C80170	C80171	C80172	C80173	C80174	C80175	C80176	C80177	C80178	C80179	C80180	C80181	C80182	C80183	C80184	C80185	C80186	C80187	C80188	C80189	C80190	C80191	C80192	C80193	C80194	C80195	C80196	C80197	C80198	C80199	C80200	C80201	C80202	C80203	C80204	C80205	C80206	C80207	C80208	C80209	C80210	C80211	C80212	C80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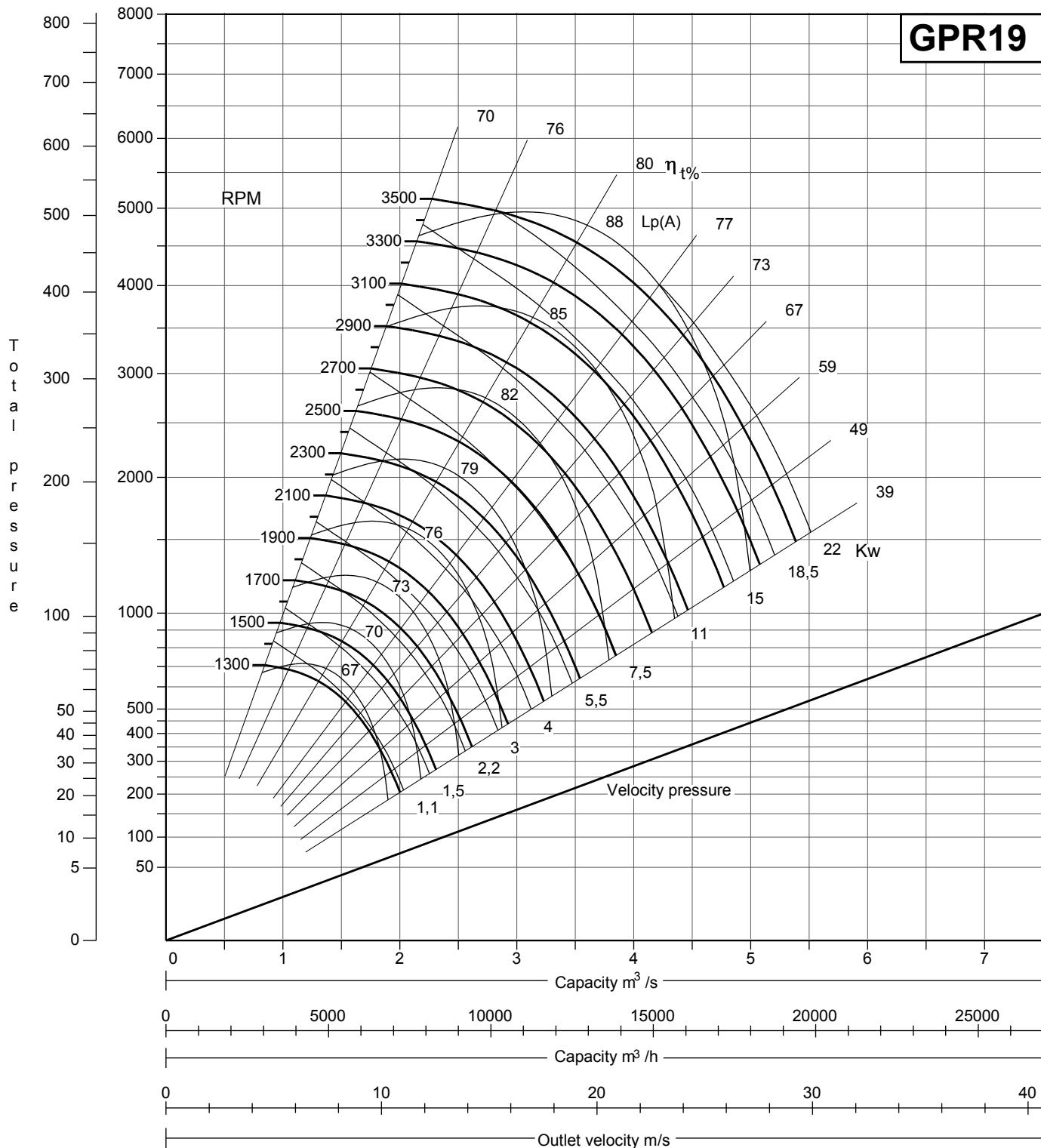




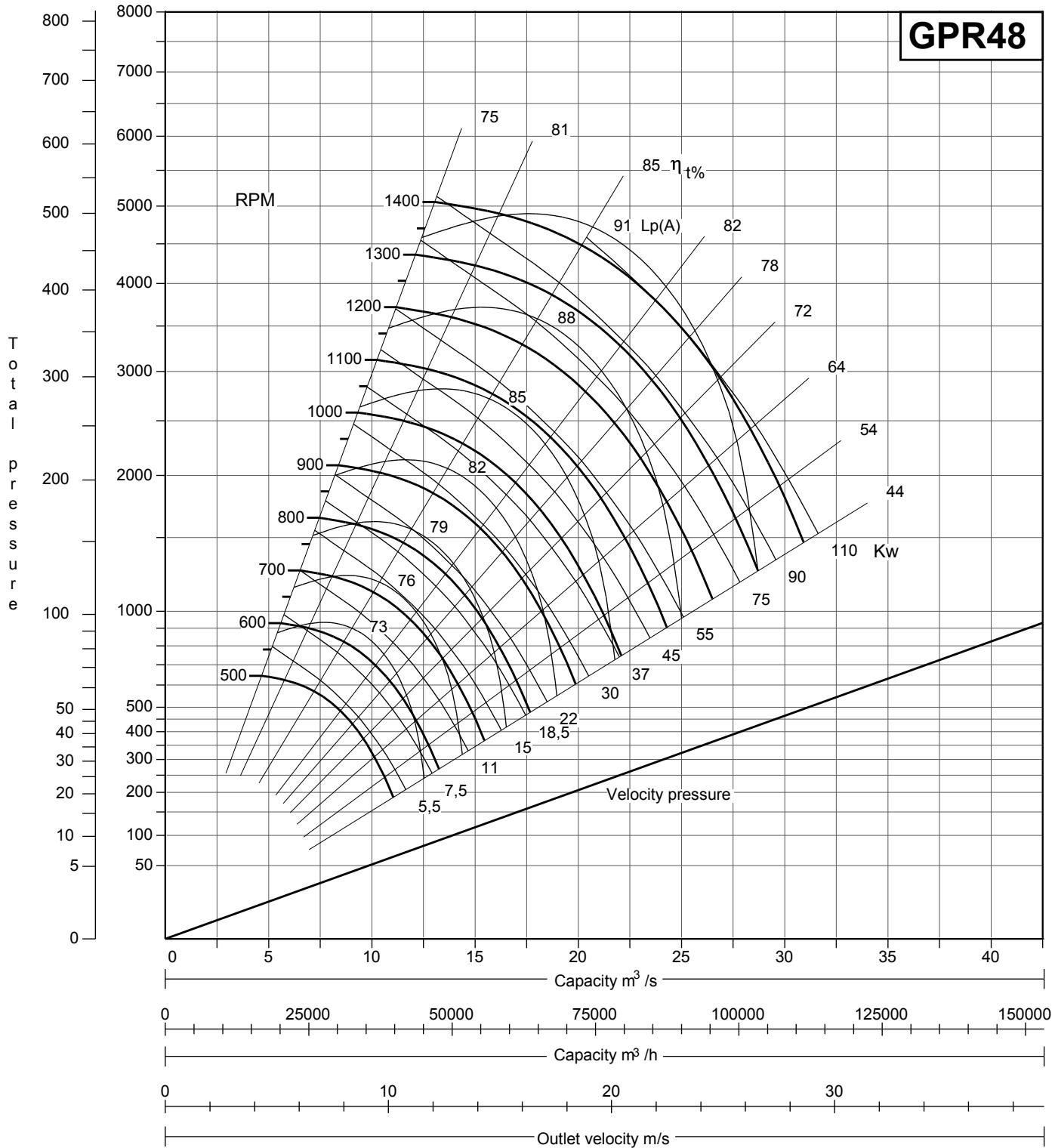
Single inlet	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM					
			20 °C	100 °C	200 °C	300 °C		
			230,00	1000	940	880		
			276,00	1250	1175	1100		
Nmax[Kw] = 92,76 x $\left[ \frac{n}{1000} \right]^3$				370,00	1400	1316		
Density = 1,204 Kg/m <sup>3</sup>					1232	1092		
mm c.a. Pa	Lp(A) = Sound pressure level in db(A) at 1,5 mt in free field with ducts connected							



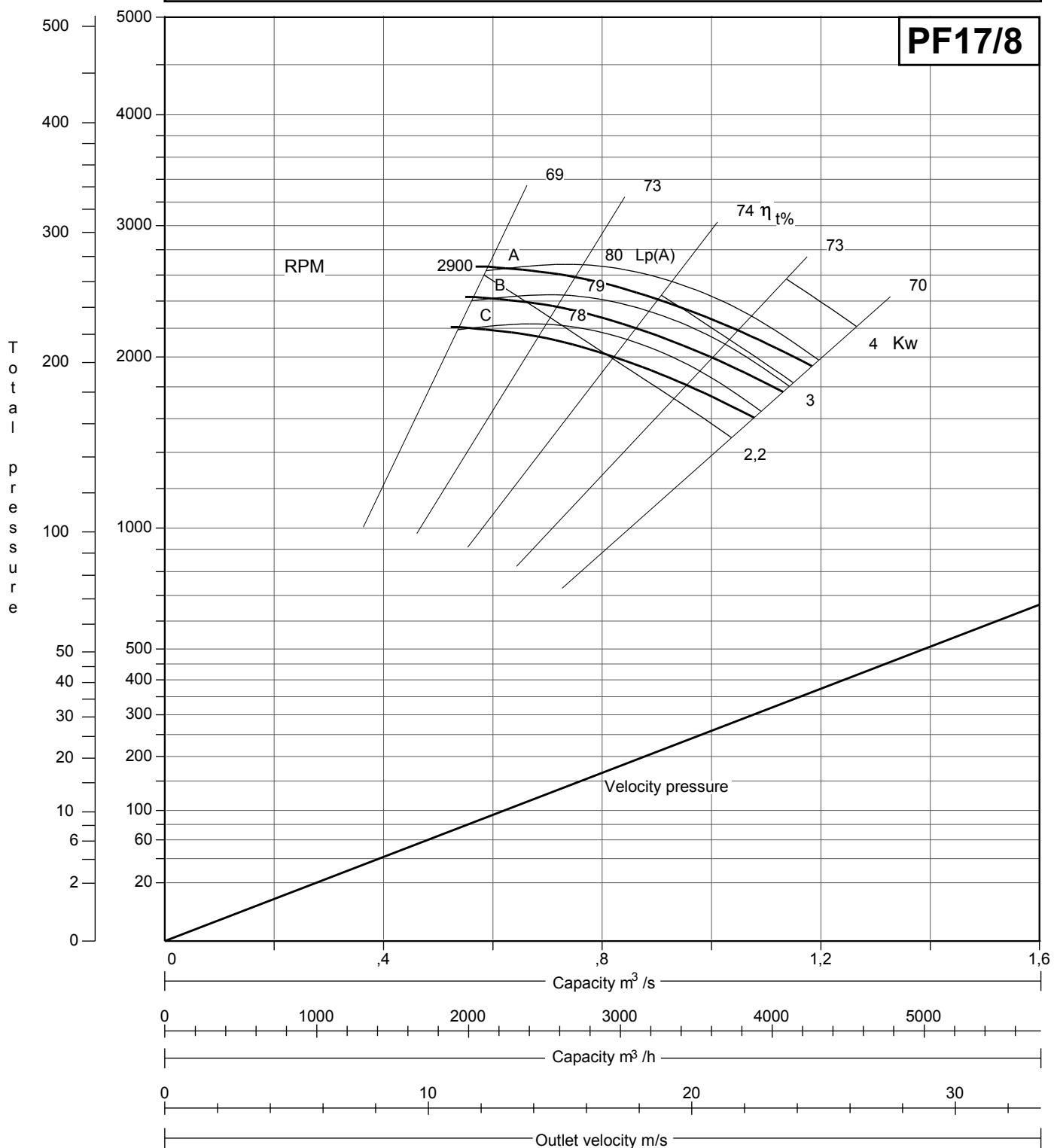
<b>Single inlet</b>	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM			
			20 °C	100 °C	200 °C	300 °C
$N[Kw] = \frac{Q[m^3/s] \times Pt[Pa]}{10 \times nt[\%]}$	II	2,30	2750	2585	2420	2145
$N_{max}[Kw] = 0,48 \times \left[ \frac{n}{1000} \right]^3$	III	2,75	3500	3290	3080	2730
Density = 1,204 Kg/m <sup>3</sup>						
mm c.a. Pa	Lp(A) = Sound pressure level in db(A) at 1,5 mt in free field with ducts connected					



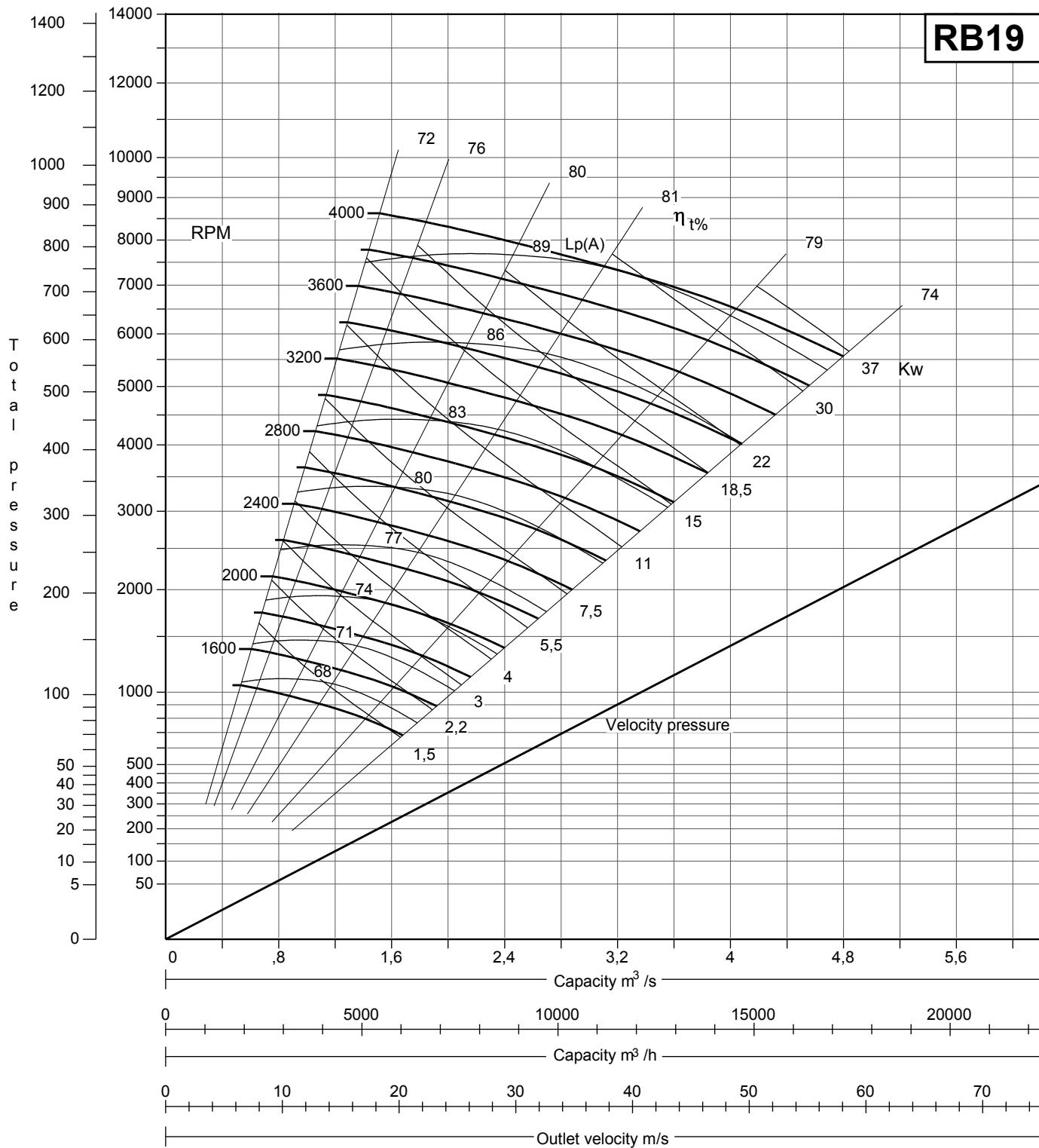
Single inlet	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM				
			20 °C	100 °C	200 °C	300 °C	
	I	143,00	780	733	686	608	
	II	150,00	1100	1034	968	858	
Nmax[Kw] = 40,08 x $\left[ \frac{n}{1000} \right]^3$				III	180,00	1400 1316 1232 1092	
Density = 1,204 Kg/m <sup>3</sup>							
mm c.a.	Pa	Lp(A) = Sound pressure level in db(A) at 1,5 mt in free field with ducts connected					



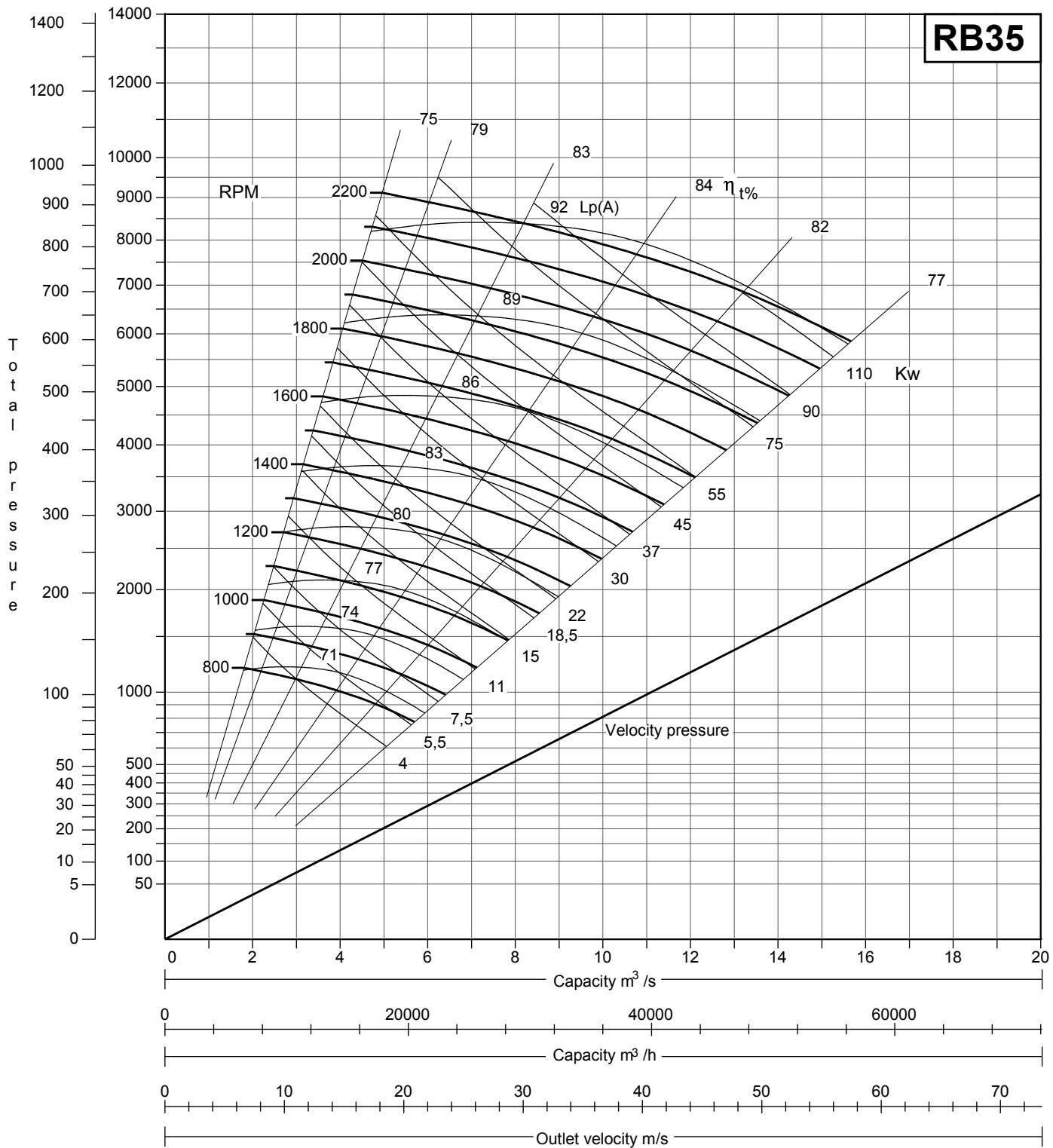
Single inlet	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM 100 °C
$N[Kw] = \frac{Q[m^3/s] \times Pt[Pa]}{10 \times nt[\%]}$	II	0,80	3000
$N_{max}[Kw] = 0,13 \times \left[ \frac{n}{1000} \right]^3$			
Density = 1,204 Kg/m <sup>3</sup>			
mm c.a. Pa	Lp(A) = Sound pressure level in db(A) at 1,5 mt in free field with ducts connected		



<b>Single inlet</b>	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM			
			20 °C	100 °C	200 °C	300 °C
$N[Kw] = \frac{Q[m^3/s] \times Pt[Pa]}{10 \times nt[\%]}$	II	2,60	3200	3008	2816	2496
$N_{max}[Kw] = 0,56 \times \left[ \frac{n}{1000} \right]^3$	III	3,10	4000	3760	3520	3120
Density = 1,204 Kg/m <sup>3</sup>						



<b>Single inlet</b>	Class	PD <sup>2</sup> Kgm <sup>2</sup>	Max RPM			
			20 °C	100 °C	200 °C	300 °C
$N[\text{Kw}] = \frac{Q[\text{m}^3/\text{s}] \times Pt[\text{Pa}]}{10 \times nt[\%]}$	II	43,60	1750	1645	1540	1365
$N_{\max}[\text{Kw}] = 11,18 \times \left[ \frac{n}{1000} \right]^3$	III	52,00	2200	2068	1936	1716
Density = 1,204 Kg/m <sup>3</sup>						
mm c.a. Pa	Lp(A) = Sound pressure level in db(A) at 1,5 mt. in free field with ducts connected					





## **MANUFACTURER'S DECLARATION N. 1652**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type PF 17/8/A**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 63K1**

**OUR CONFIRMATION**           **85.12/A**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

The person authorized to compile the technical file is:

TAGLIABUE SONIA - Via Napoli, 45 - 20813 - BOVISIO MASCIAGO - MB

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **MANUFACTURER'S DECLARATION N. 1653**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type GPR 19**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 64K1**

**OUR CONFIRMATION**           **85.12/B**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

The person authorized to compile the technical file is:

TAGLIABUE SONIA - Via Napoli, 45 - 20813 - BOVISIO MASCIAGO - MB

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **MANUFACTURER'S DECLARATION N. 1654**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type GPR 48**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 64K2**

**OUR CONFIRMATION**           **85.12/C**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

The person authorized to compile the technical file is:

TAGLIABUE SONIA - Via Napoli, 45 - 20813 - BOVISIO MASCIAGO - MB

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **MANUFACTURER'S DECLARATION N. 1655**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type GPH 52**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 64K3**

**OUR CONFIRMATION**           **85.12/D**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

The person authorized to compile the technical file is:

TAGLIABUE SONIA - Via Napoli, 45 - 20813 - BOVISIO MASCIAGO - MB

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **MANUFACTURER'S DECLARATION N. 1656**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type RB 35**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 64K4**

**OUR CONFIRMATION**           **85.12/E**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

The person authorized to compile the technical file is:

TAGLIABUE SONIA - Via Napoli, 45 - 20813 - BOVISIO MASCIAGO - MB

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## **MANUFACTURER'S DECLARATION N. 1657**

**In accordance with annex IIB of EEC Machinery Directive 2006/42/CE**

We                   **ARIVENT ITALIANA S.R.L.**

Via Napoli, 45

20813 - BOVISIO MASCIAGO

declare under our responsibility that the nearly machine

**DESCRIPTION AND TYPE**           **Centrifugal fan type RB 19**

**MANUFACTURING YEAR**           **2012**

**YOUR ORDER**                   **120840 – JOB 2F11A – ITEM 65K1**

**OUR CONFIRMATION**           **85.12/F**

is in accordance with EEC Directive 2006/42/CE and is intended to be incorporated into a machine/plant or to be assembled with other machines/plants to obtain a machine/plant subject to the above mentioned Machinery Directive. Therefore it is forbidden to start it before the machine/plant where it will be built in has been declared to be conforming to the EEC Directive 2006/42/CE.

**NOTE: It is forbidden the running of this machine if it is not canalized as for contract.**

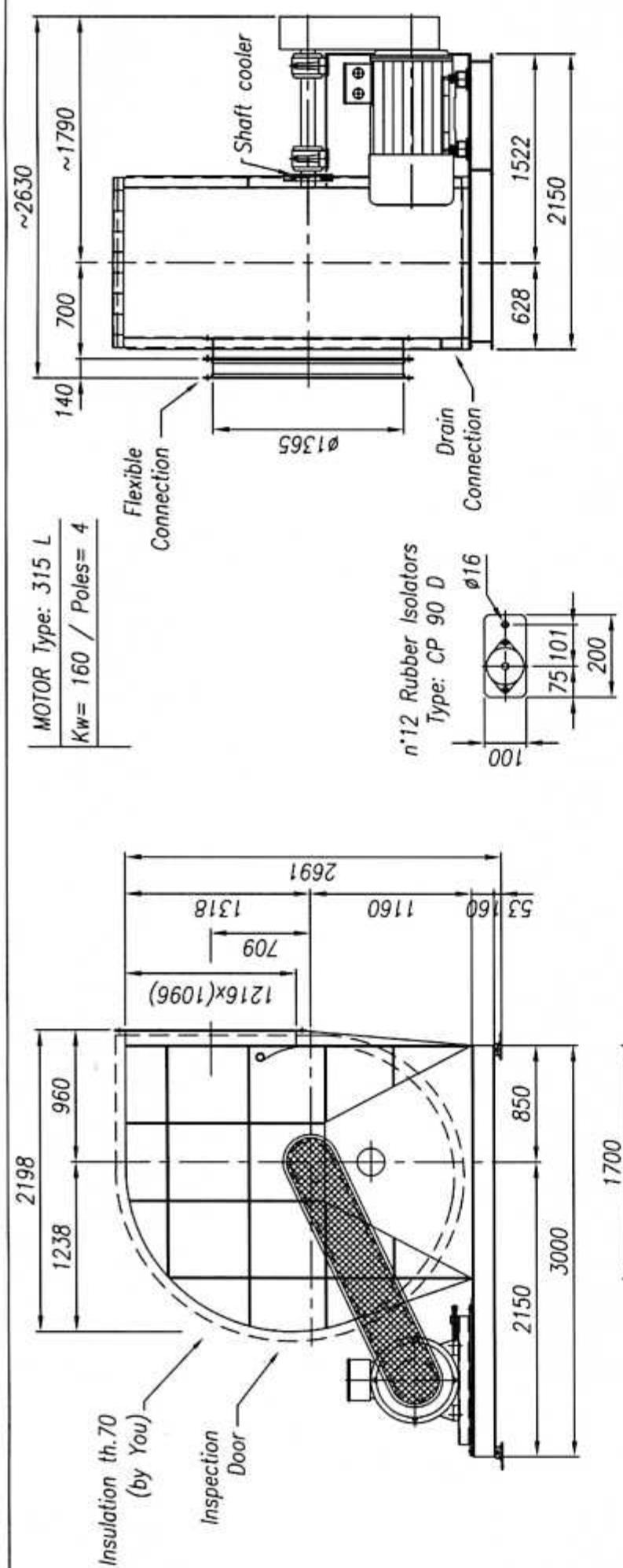
The person authorized to compile the technical file is:

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**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**

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ARIVENT ITALIANA  
CODICI DI DISTRIBUZIONE  
---/---/---/---/---/---

REV.  
GPH.12.0190  
SHEET 1 OF 1

SIZE  
A3

DRAWING CENTRIFUGAL  
FAN Type: GPH 52  
S/N / gtr.1 / RO3

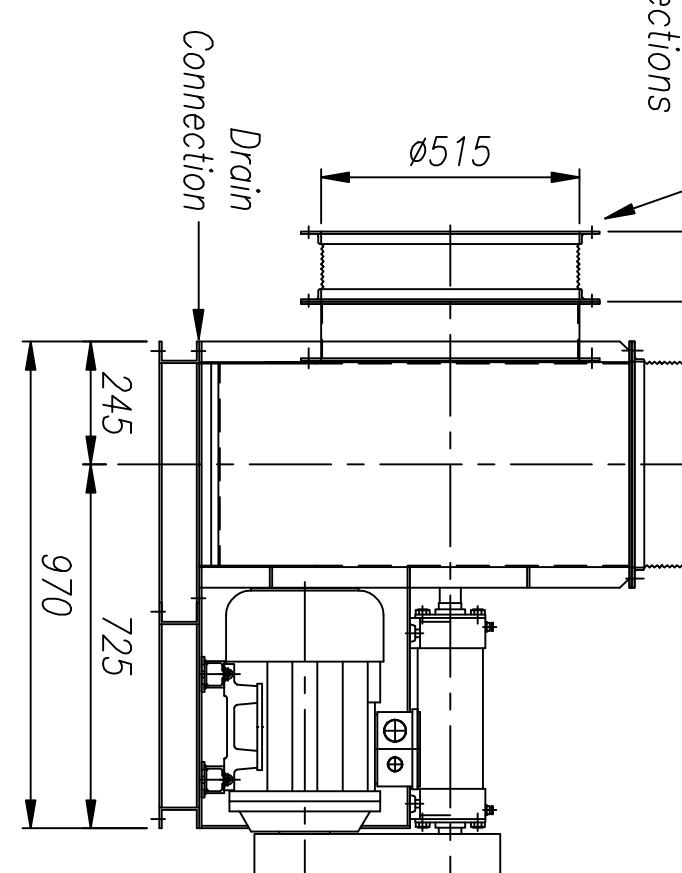
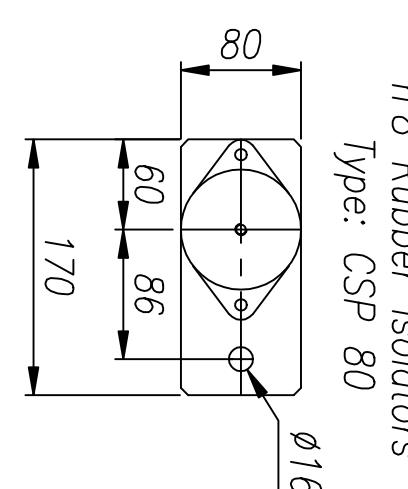
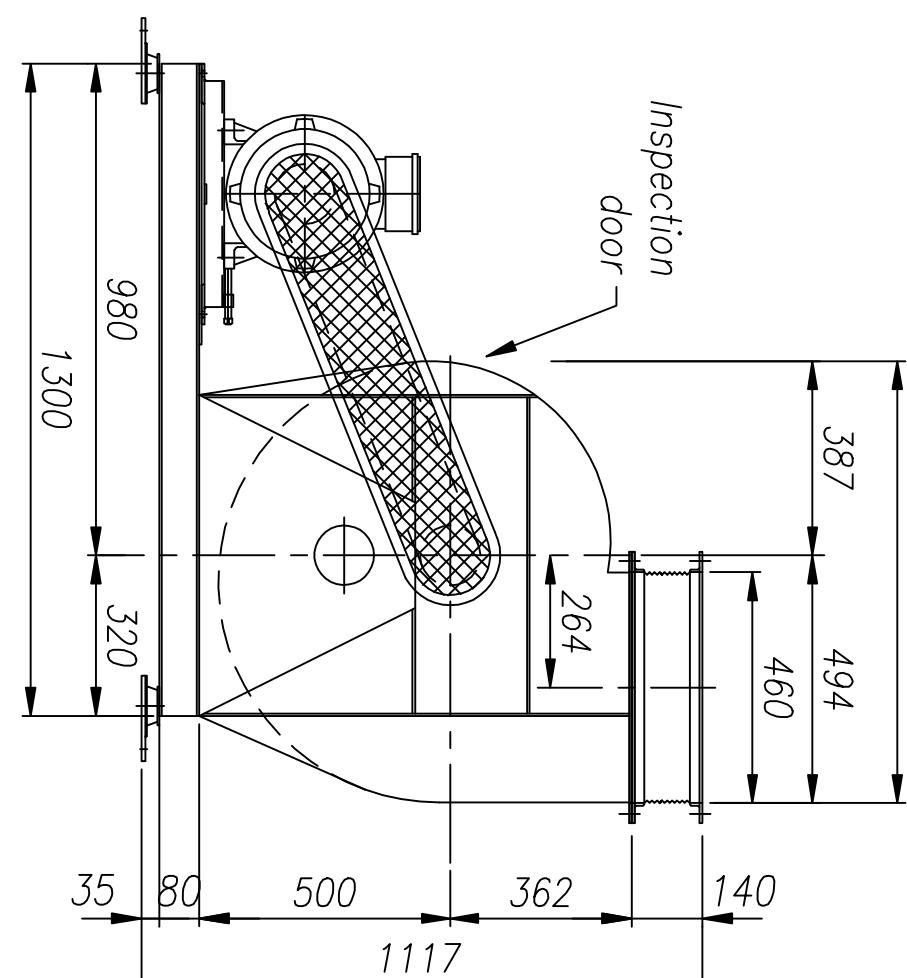
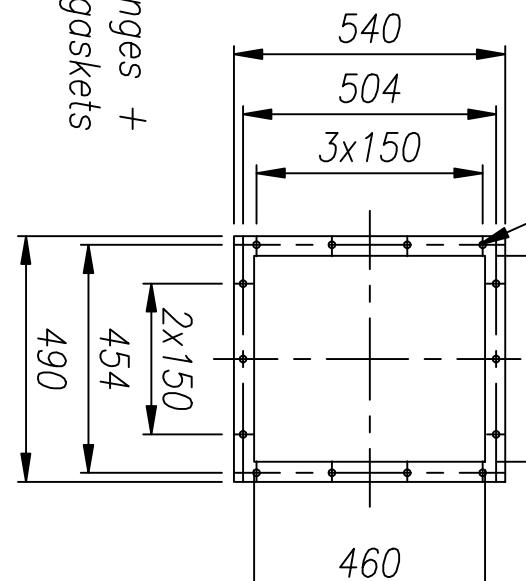
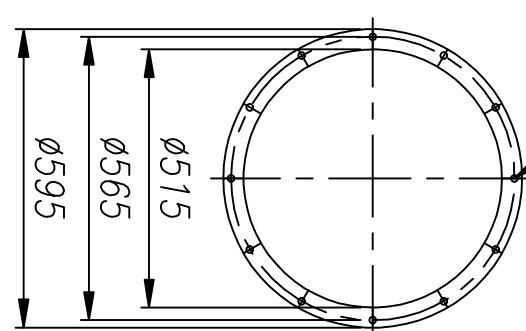
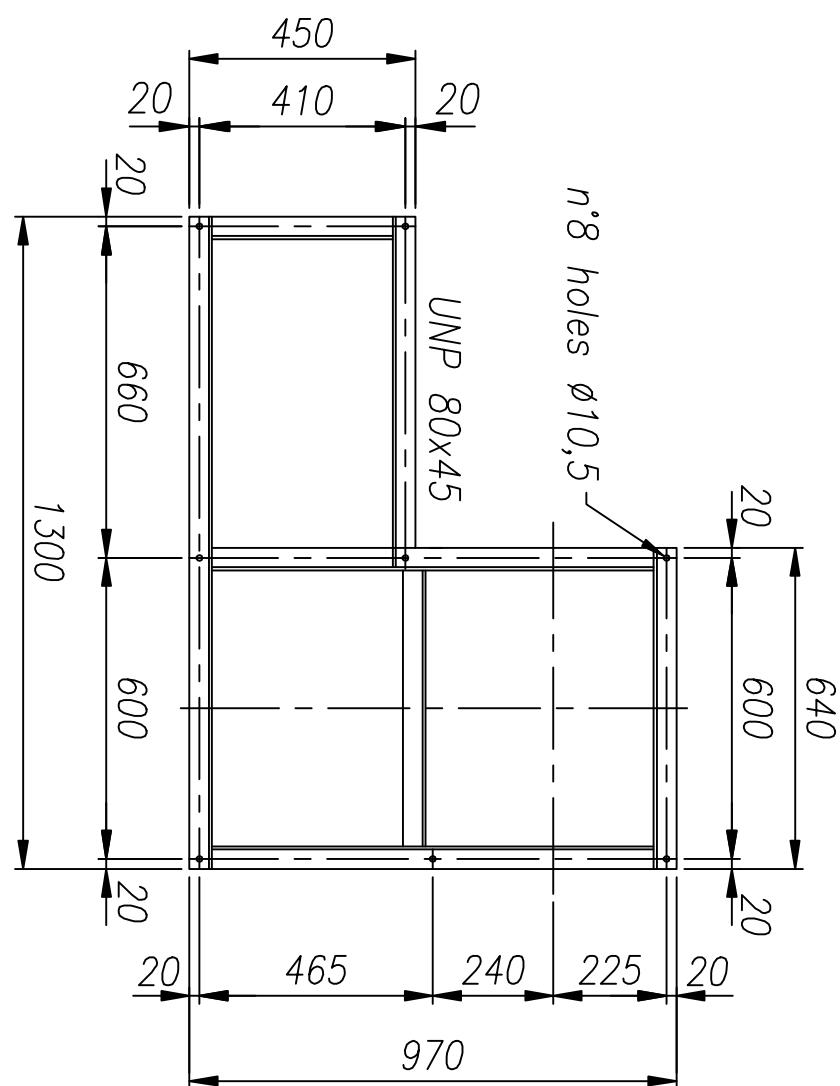
WEIGHT  
STATIC LOAD Kg.: 3700  
DYNAMIC LOAD Kg.: 900

DW, WIHOUJ VOL.:  
DEC.:  
DEC.:  
ANGOLI:

30/04/12

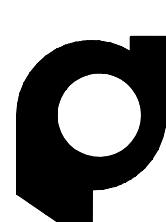
D.S. : S.R.  
CONT.:  
R.Q. :  
BAILESTRA

STATO PARTE \_\_\_\_\_  
CODICE OPER. \_\_\_\_\_



Your Job n° 2F11 / ITEM: 64K1

STATO PARTE	DIS. : S.R.	30/04/12	DIM. WITHOUT TOLL.:	WEIGHT	DRAWING CENTRIFUGAL	MOD. REV. DATA
CONT.:		1 DEC.:	STATIC LOAD Kg.:	470	FAN Type: GPR 19	dimension M.G. 28/05/12
CODICE OPER.	R.Q. :	2 DEC.:	DYNAMIC LOAD Kg.:	80	c.l./l / arr.1 / RA1	dimension S.R. 14/09/12
BALLESTRA			ALL DIM. IN mm			

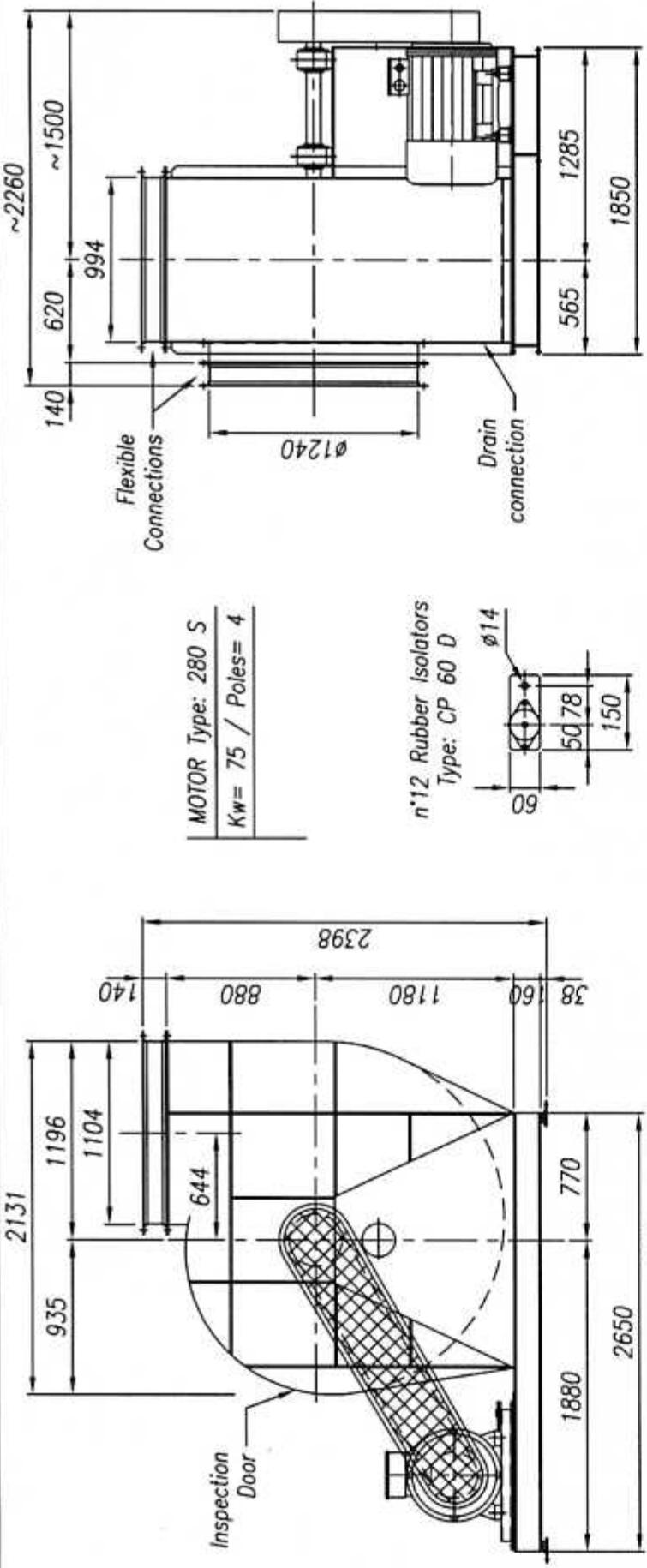


CODICI DI DISTRIBUZIONE  
--/-/-/-/-/-/-/-

GPR. 12.0188  
REV.  
A3

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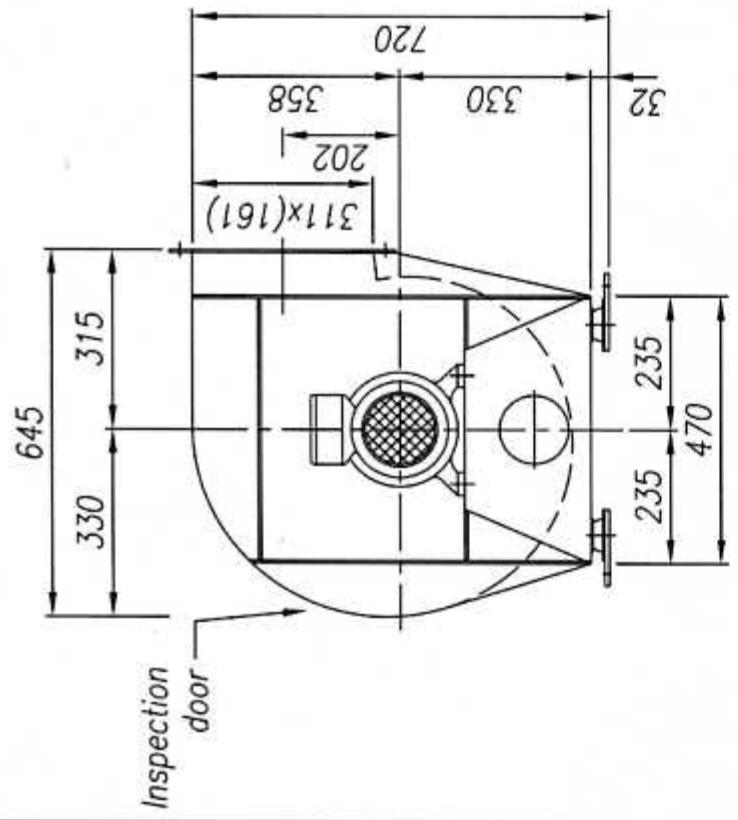
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GPR.12.0189 REV.  
SHEET 1 OF 1

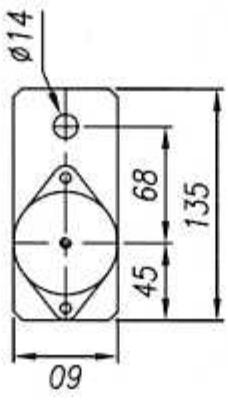
Your Job n' 2F11 / ITEM: 64K2

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	CONT.:		1 DEC.; 2 DEC.; ANGOL.				
CODICE OPER.	R.Q. :		ALL DIM. IN mm	SIZE A3	SHEET 1 OF 1		
	BALLESTRA						

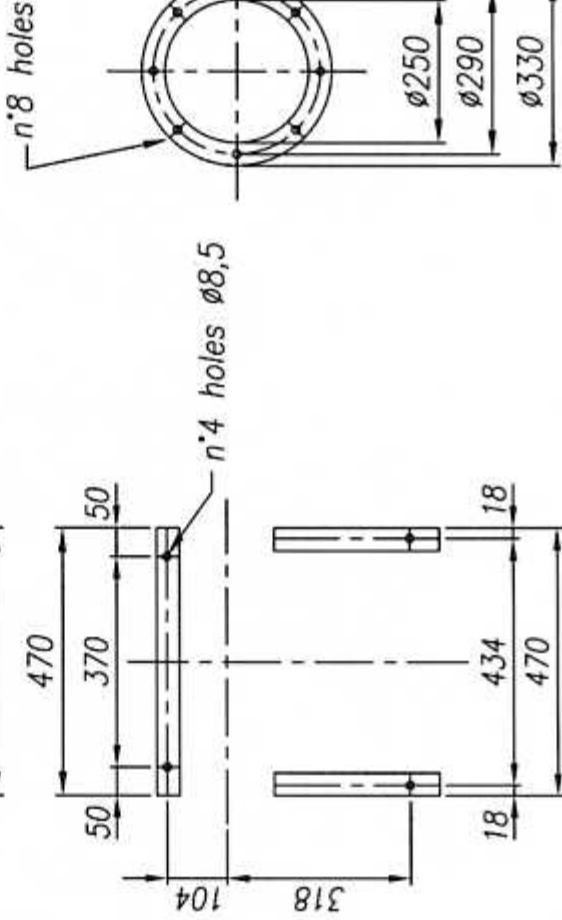
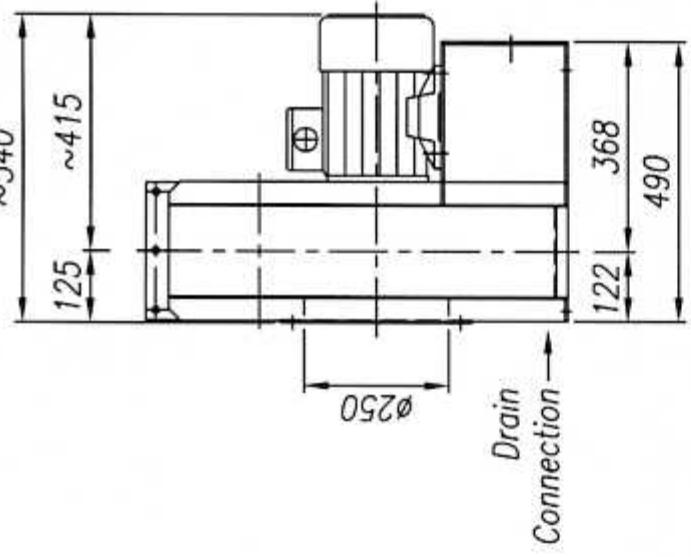
MOTOR Type: 112 M  
 $K_w = 4$  / Poles = 2



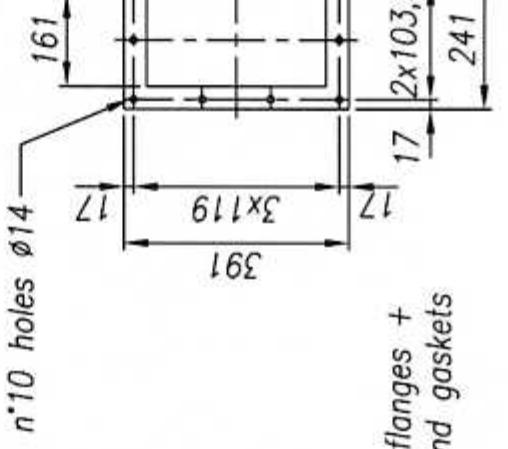
n\*4 Rubber isolators  
 Type: CSP 60



Drain  
 Connection



Counterflanges +  
 bolts and gaskets



MOD. REV. DATA

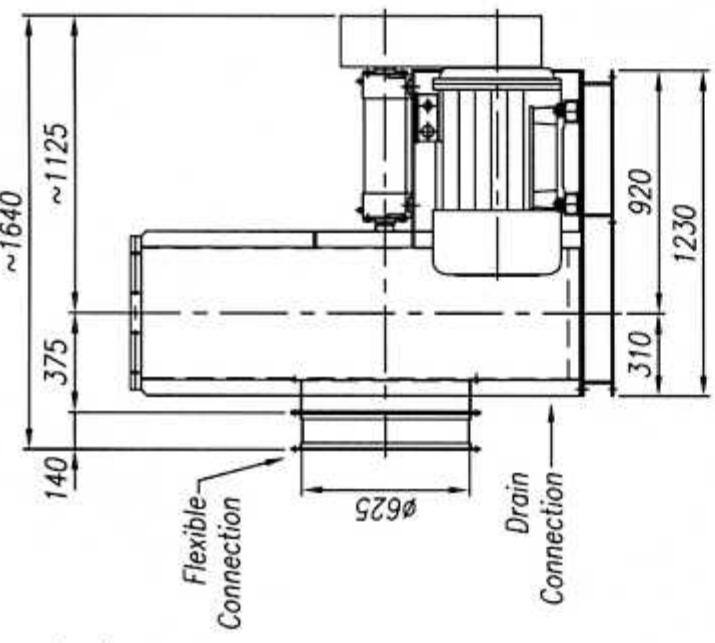


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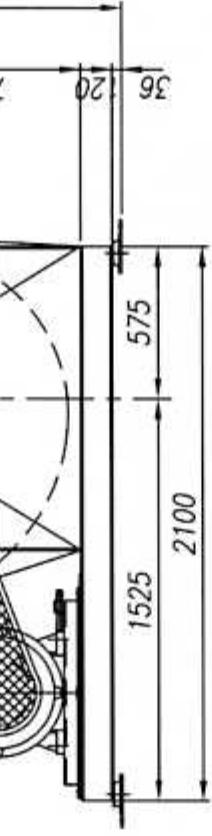
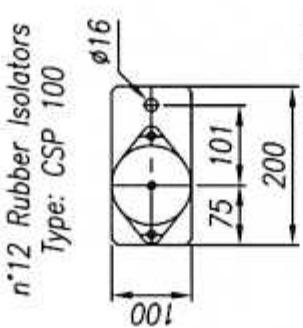
Your Job n° 2F11 / ITEM: 63K1

STATO PARTE	DIS. : S.R.	W/04/12	DIM. WITHOUT TOLL:	WEIGHT	DRAWING CENTRIFUGAL	PF. 12.0187	REV.
CONT.:			1 DEC.:	STATIC LOAD Kg.: 100	FAN Type: PF 17/8		
CODICE OPER.	R.Q. :		2 DEC.:	DYNAMIC LOAD Kg.: 35	c.l.II / arr.4 / R03		
	BALLESTRA		ANGOLI:	ALL DIM. IN mm			

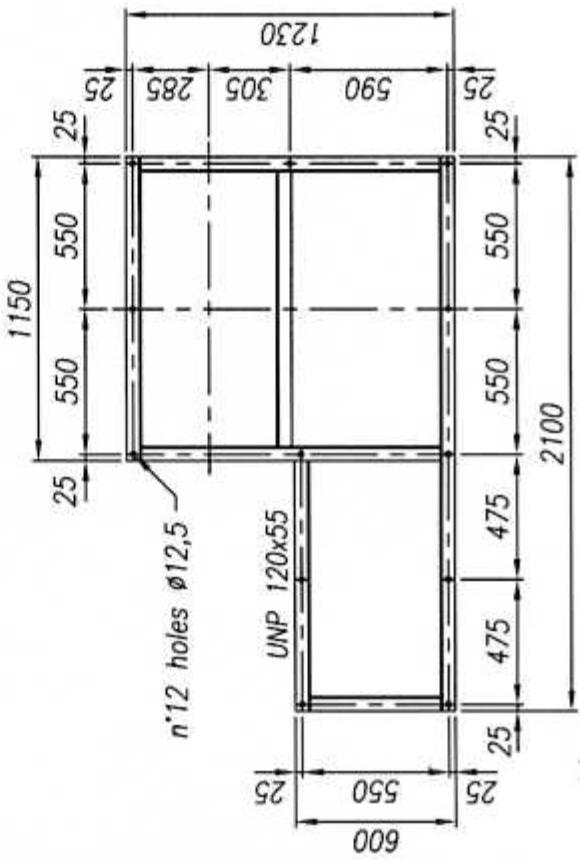
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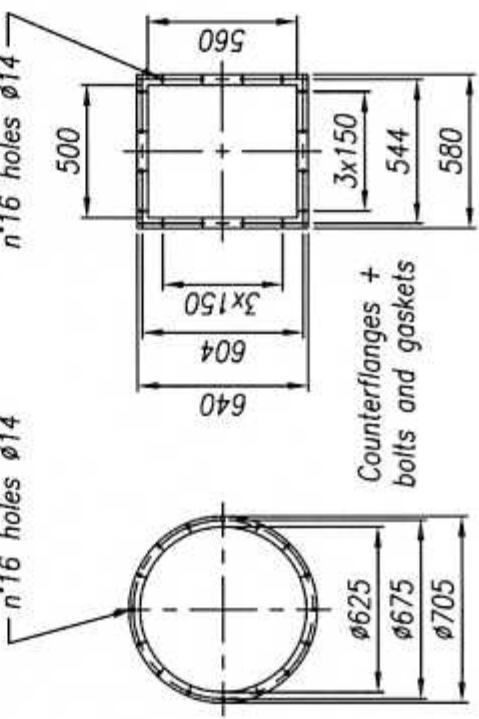
MOTOR Type: 250 M  
 $K_w = 55$  / Poles = 4



Inspection door



MOD. REV. DATA

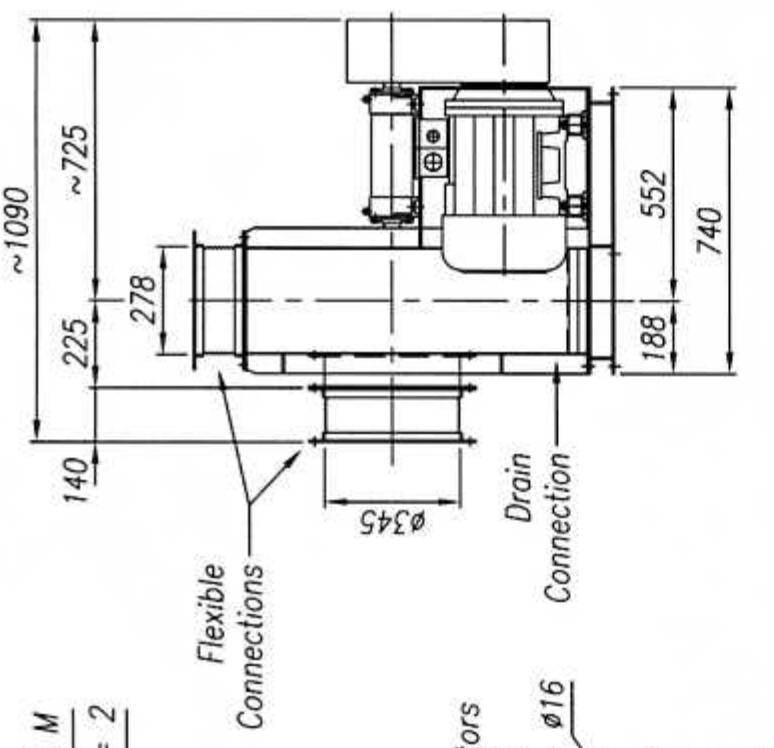


Your Job n° 2F11 / ITEM: 64K4

DRAWING CENTRIFUGAL	RB. 12.0191	REV.
FAN Type: RB 35		
cl. III / arr. I / R03		
SHEET 1 OF 1		

STATO PARTE	DIS. :	S.R.	Ø2/Ø5/12	DIM. WITHOUT TOLL.:	WEIGHT
CONT.:				1 DEC.:	STATIC LOAD Kg.: 1300
CODICE OPER.	R.Q. :	BALLESTRA		2 DEC.:	DYNAMIC LOAD Kg.: 300
				ANGOLI:	ALL DIM. IN mm

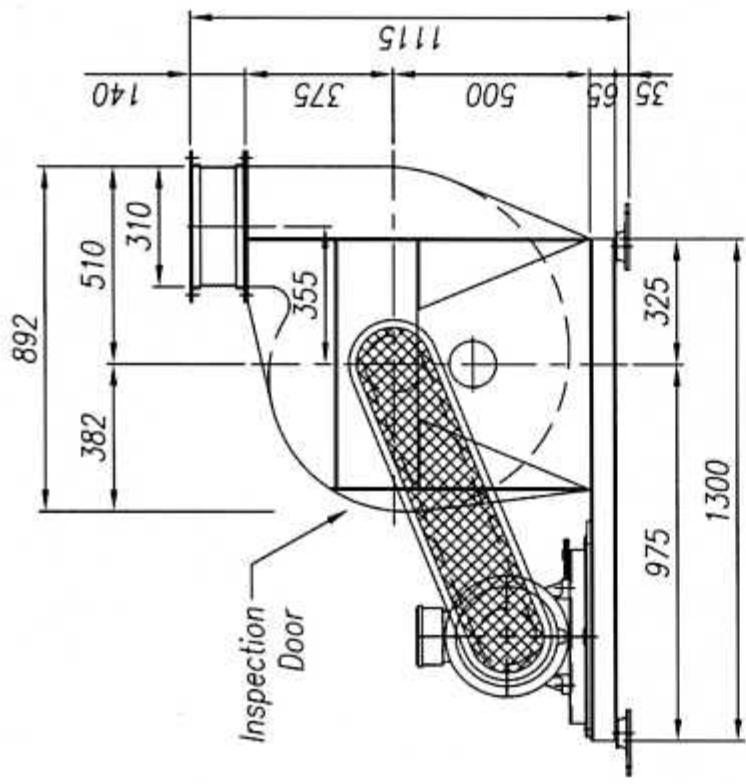
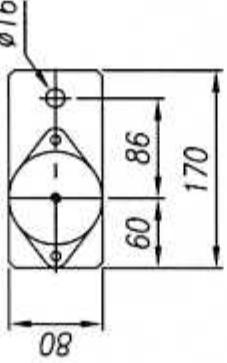
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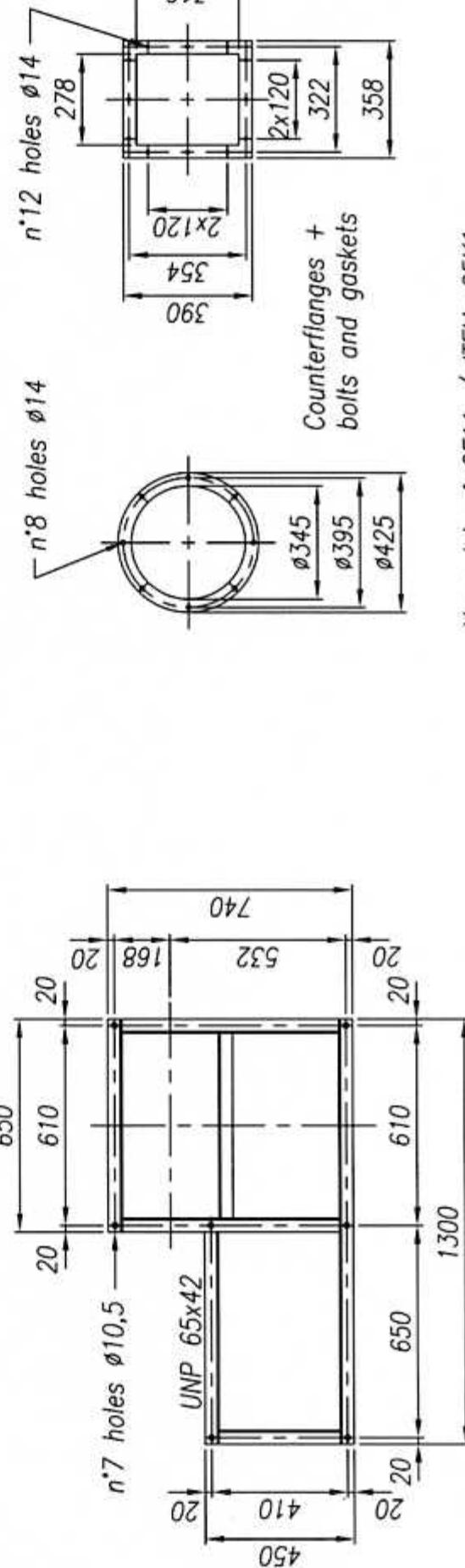
Flexible  
Connections

Drain  
Connection

n'7 Rubber Isolators  
Type: CSP 80



Inspection  
Door



Your Job n° 2F11 / ITEM: 65K1

MOD. REV. DATA



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codice di distribuzione  
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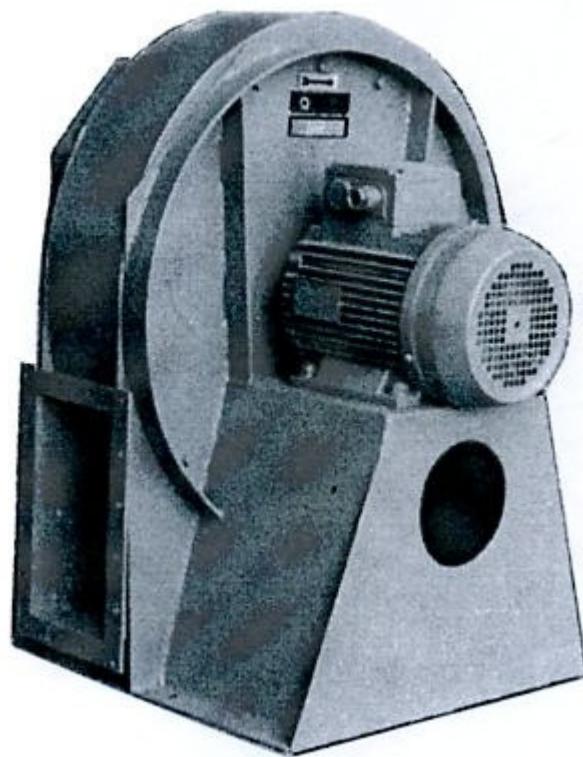
REV.  
RB. 12.0193  
SIZE A3  
SHEET 1 OF 1

DRAWING CENTRIFUGAL  
FAN Type: RB 19  
cl.II / arr.1 / RA1

STATO PARTE	DIS. : S.R.	02/05/12	DIM. WITHOUT TOLL:	WEIGHT
CONT.:			1 DEC.: 2 DEC.: ANGOLI: BALLASTRA	STATIC LOAD Kg.: 450 DYNAMIC LOAD Kg.: 75 ALL DIM. IN mm
CODICE OPER.	R.Q. :			
	BALLESTRA			

## **CENTRIFUGAL FAN - ARRANGEMENT 4**

### **OPERATING MANUAL**



**ARIVENT ITALIANA SRL**  
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20030 - Bovisio Masciago - Mi  
Phone +39 0362 590736 - Fax +39 0362 593360  
Email: [info@arivent.it](mailto:info@arivent.it)



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## 1. Safety

### 1.1 General

The fan meets the technical safety standards applicable in the EC at the time of delivery.

The rules and regulations for the prevention of accidents applicable at the time of delivery were taken into account in the fan design.

It is not allowed to modify the original condition of the fan without the approval.

The warranty expires when parts other than original spare parts and/or purchased parts not corresponding to the original parts are used.

The operating manual and any required supplementary manuals must be available to the operator.

Do not open inspection ports and/or other openings when the fan is in operation.

### 1.2 Start-up

The fan may only be put into operation (also for testing) when the inlet and outlet ports are provided with suitable guards or when pipes are connected to them.

Before the fan is started the housing and all pipes connected to it must be checked. They must be dry and free of screws, bolts, tools and other foreign substances.

Disregarding the above instructions may cause accidents and destroy the fan.  
Observe the safety regulations for electrical machines and equipment.

### 1.3 Servicing

The fan may only be serviced when the electrical system is dead, i.e.:

- ✓ turn off the electrical machines and ensure that they cannot be switched on again;
- ✓ wait until the rotor has come to a standstill;
- ✓ disconnect the power supply cable for the motor.

After servicing all guards and protective devices must be installed and all pipes must be connected again.

All bolts and nuts must be tightened. Close all inspection openings and tighten the bolts and nuts.

The fan can then be put into operation again.



## 1.4 Cleaning

**Do not clean moving parts when the fan is in operation!**

Before cleaning the fan must be put out of operation. Ensure that the fan cannot be switched on again accidentally.

Only use suitable detergents and cleaning materials.

If material is sticking to the impeller or the impeller is worn, the fan may be seriously damaged by unbalance.

It is therefore recommended to clean and check the fan for unusual vibrations at regular intervals.

## 1.5 Electrical safety

The user has to ensure that the fan is only connected and serviced by a qualified electrician in accordance with the rules and regulations applying to electrical equipment.

The user must also ensure that the fan is operated in accordance with electrotechnical rules and regulations.

Do not touch/work on live parts.

- ✓ Interrupt the power supply to the fan and use mechanical means to ensure that power supply cannot be switched on again.
- ✓ Use a voltage tester to check that the circuit is dead.
- ✓ Connect and short the work site to earth.
- ✓ Only use the fuses indicated in the electric circuit diagram.
- ✓ Check the condition of the visible cables before the fan is started.
- ✓ Replace damaged cables.

Damaged and/or defective electrical equipment must be repaired or replaced immediately.

If the damaged equipment represents a risk, the fan may not be put into operation before the defect is repaired.

## 1.6 Description of labels and plates

The following plates are attached to the fan:

**1. Nameplate**

The nameplate indicates:

TYPE

COM. - NO.

YEAR OF CONSTRUCTION

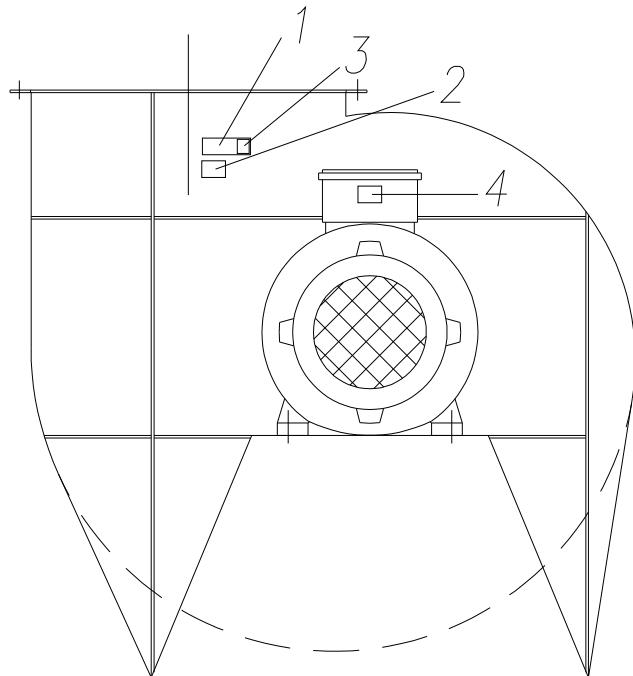
Further data are indicated on the master card of the fan.

**2. Arrow**

It shows the sense of rotation of the impeller.

**3. CE label**

**4. Motor nameplate**

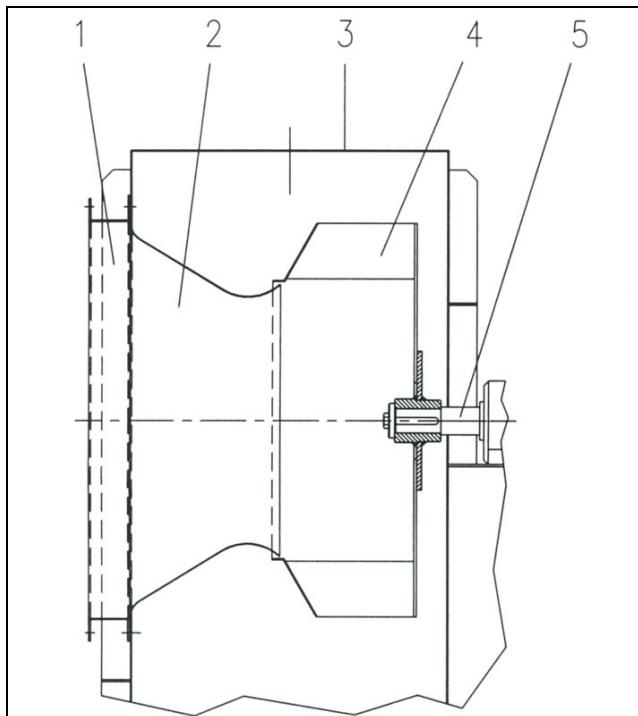


## 2. Description

### 2.1 Design

The fan is a welded single-stage centrifugal fan.

It is driven directly by the motor shaft on which the impeller is mounted.



1. *Inlet socket*
2. *Inlet cone*
3. *Casing*
4. *Impeller*
5. *Shaft*

## 3. Assembly and installation

### 3.1 Delivery

When delivered the fan and accessories must be checked for damage.  
Check that everything indicated on the delivery note has been delivered.  
In all other respects please refer to our terms and conditions for sales and delivery.

### 3.2 Transport

Only transport the fan with transport facilities which are appropriate for the conditions on the site where the fan is to be installed.

Observe the applicable rules and regulations for the prevention of accidents.  
For lifting and transporting the fan only ropes and/or fork lift tracks with a sufficient lifting capacity may be used.

Only attach ropes to the fastening plates especially provided for lifting the fan.



Warranty claims or claims for compensation for any damage caused by the use of unsuitable means of transport or caused by improper handling will not be accepted.

### 3.3 Storage

If the fan is not installed and/or put into operation immediately it must be stored in a dry place which is free of vibrations.

In case of long-term storage please note the storage and preservation instructions for motors.

In case of prolonged standstill periods please note the relevant instructions for the storage of motors and fans.

### 3.4 Installation site

The installation site must be level and have a sufficient load bearing capacity. There must be enough room for assembly and maintenance work. The impeller must be easily accessible.

### 3.5 Pipes connected to the fan

When attaching the pipes to the fan care must be taken that the fan is not distorted.

- ✓ Remove the transport shutters from the connection ports.
- ✓ Connect the pipes with flexible connections to the inlet and outlet ports of the fan.

### 3.6 Electrical connection

The fan may only be connected up to the electrical system by a qualified electrician.

The drive motors are usually installed in the manufacturing works.

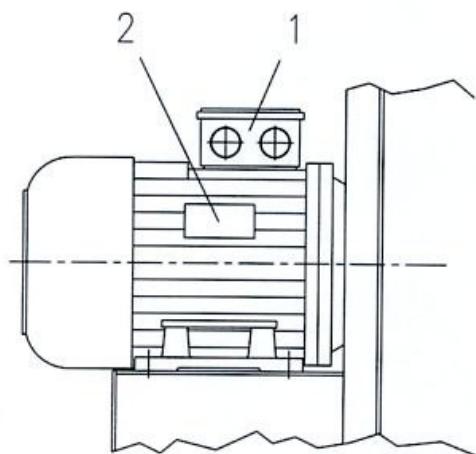
If the customer installs the motor, the warranty is submitted to a correct installation.

The motor is connected in accordance with the circuit diagram inside the terminal box (1).

The customer has to check that his power network and the switchgear and monitoring devices are sufficiently dimensioned to cope with the transient behaviour and current peaks. It must be ensured that the supply of cooling air to the electric motor is not hindered.

- ✓ The power supply cable for the fan must be installed in accordance with any locally applicable legal stipulations.
- ✓ Compare the local mains voltage with the voltage indicated on the rating plate (2) of the fan.

- ✓ Connect the fan as shown on the circuit diagram inside the terminal box (1).
- ✓ Earth the fan in accordance with the regulations issued by the local power supply company.
- ✓ Check the speed and sense of rotation.
- ✓ Check the transient behaviour and starting time.
- ✓ Provide for a motor protection system.



## 3.7 Inspection

### 3.7.1 Mechanical testing

Check the fan after it has been assembled and installed:

- ✓ check the attachment of the fan to the foundation;
- ✓ check if the impeller rotates freely;
- ✓ remove any foreign objects from the fan housing;
- ✓ check all screw couplings and bolted connections;
- ✓ check all pipe connections.



### 3.7.2 Electrical testing

The electrical system of the fan may only be tested by a qualified electrician:

- ✓ check the operating voltage;
- ✓ check the earthing;
- ✓ check the size of the fuses.

If the fan is not put into operations immediately after it has been assembled and installed, it must be secured against unauthorized use and covered with a tarpaulin.

## 4. Start-up

### 4.1 Putting the fan into operation

The fan may only be put into operation by qualified and skilled staff.

Before the fan is put into operation the staff must check that the fan is in good working order.

The rules and regulations for putting electrical machines into operation must be observed:

- ✓ check the safety systems;
- ✓ close the damper or inlet vane control (if provided);
- ✓ switch on the master controller;
- ✓ switch on the fan.

The fan may only be switched on when the pipes are connected and when it is certain that there will be a sufficient plant resistance after the fan motor has reached its full operating speed:

- ✓ check the sense of rotation when the fan is started up for the first time (the fan must rotate in the direction indicated by the arrow);
- ✓ check the power consumption. The maximum permissible power consumption may not be exceeded.

### 4.2 Putting the fan out of operation

Switch off the fan.

## 4.3 Transient behaviour

### 4.3.1 General

The fan can only be started when a sufficiently high moment of acceleration is available from the moment it is started up to the moment when **nominal speed** is reached.

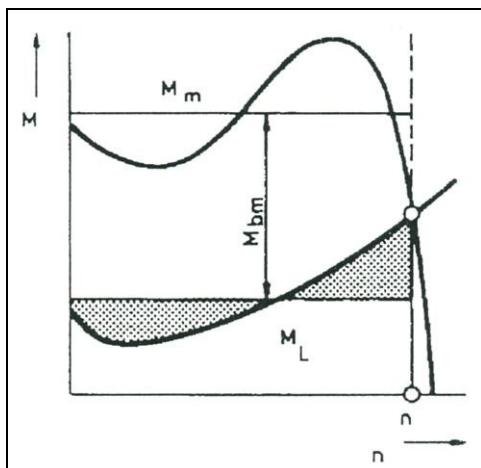
It is recommended to start the fan with the damper or inlet vane control closed. The customer has to check that his power network, switchgear, monitoring devices (if available) and cable cross sections are dimensioned to cope with the transient behaviour and current peaks.

### 4.3.2 Direct starting

Direct starting of the fan motor not only causes a high starting torque but also a high starting current.

**During starting the starting current may be 6 to 8 times as high as the nominal current (depending on the type of rotor).**

This high power input must be taken into account when the fuse sizes are determined.



$M_m$       *Motor moment*

$M_L$       *Load moment*

$M_{bm}$       *Mean accelerating moment*

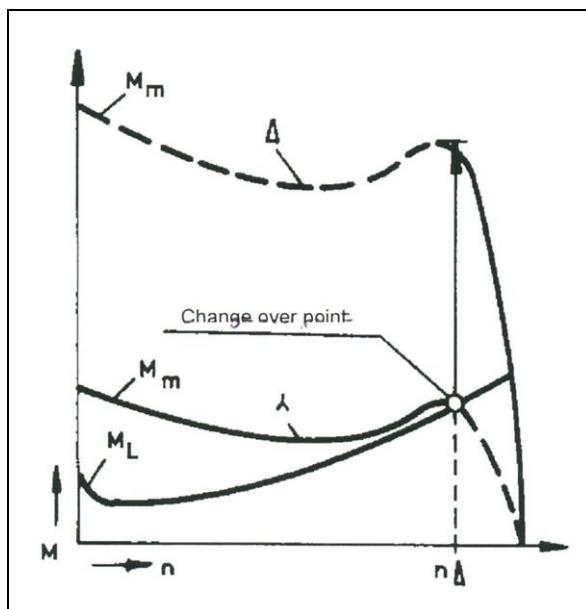
$n$       *Speed*

*Designation of Mean accelerating moment*

### 4.3.3 Star-delta starting

During star-delta starting the drive motor only provides for 1/3 of the starting torque in the star connection.

At a certain starting speed the load moment of the fan exceeds the starting torque of the motor. The motor does not accelerate. At this point the motor has to be changed over to the delta connection. The current peak which is then obtained is clearly lower than the one occurring during direct starting.



## 5. Care and maintenance

### 5.1 Lubrication

The fan must be checked at regular intervals (depending on the operating conditions).

#### 5.1.1 Drive motor

The motor must be serviced in accordance with the motor's lubricating instructions.

## 5.3 Troubleshooting

Trouble	Possible cause	Action
<b>Unsteady operation of fan</b>	Material sticking to impeller blades Worn impeller Impeller deformed by heat Fan distorted because of uneven foundation Strain exerted by connected pipes	Carefully clean impeller Replace impeller Replace impeller Remove fan from foundation and level foundation. Fasten fan to foundation again Use flexible pipe connections
<b>Fan produces a grinding noise</b>	Impeller rubs against inlet nozzle Motor noise	Realign, check and correct pipe if necessary Check if bearings are damaged and replace bearings if necessary
<b>The power input indicated on the rating plate is constantly exceeded</b>	Too much air volume Different speed with 60 Hz	Reduce air volume using a damper until the permissible power input is reached Check frequency

### 5.3 Troubleshooting (cont'd)

Trouble	Possible cause	Action
<b>Fan does not accelerate</b>	Improper connection of drive motor Motor does not change from star to delta connection Fan operates against insufficient plant resistance Motor protection system is not strong enough Starting time is too long Faulty drive motor Starting/re-starting when fan is hot Starting current too high	Check connection Shorten change-over time from star to delta Close the dampers or install additional plate shutters Cable cross section and protective system must withstand starting current during acceleration Close the dampers, check starting torque of $M_A/M_N$ motor Check motor and replace if necessary Switching frequency too high, let motor run through (control via dampers) Wrong voltage. Provide star-delta starting, local mains not strong enough

## **CENTRIFUGAL FAN - ARRANGEMENT 12**

### **OPERATING MANUAL**



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Phone +39 0362 590736 - Fax +39 0362 593360  
Email: [info@arivent.it](mailto:info@arivent.it)



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  - 5.2.2 Belt tension
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  - 5.3.1 Troubleshooting - Bearings
  - 5.3.2 Troubleshooting - Drive belts



## 1. Safety

### 1.1 General

The fan meets the technical safety standards applicable in the EC at the time of delivery.

The rules and regulations for the prevention of accidents applicable at the time of delivery were taken into account in the fan design.

It is not allowed to modify the original condition of the fan without the approval.

The warranty expires when parts other than original spare parts and/or purchased parts not corresponding to the original parts are used.

The operating manual and any required supplementary manuals must be available to the operator.

Do not open inspection ports and/or other openings when the fan is in operation.

### 1.2 Start-up

The fan may only be put into operation (also for testing) when the inlet and outlet ports are provided with guards or when pipes are connected to them. Before the fan is started the housing and all pipes connected to it must be checked. They must be dry and free of screws, bolts, tools and other foreign substances.

Disregarding the above instructions may cause accidents and destroy the fan. Observe the safety regulations for electrical machines and equipment.

### 1.3 Servicing

The fan may only be serviced when the electrical system is dead, i.e.:

- ✓ turn off the electrical machines and ensure that they cannot be switched on again;
- ✓ wait until the impeller has come to a standstill;
- ✓ disconnect the power supply cable for the motor.

After servicing all guards and protective devices must be installed and all pipes must be connected again.

All bolts and nuts must be tightened. Close all inspection openings and tighten the bolts and nuts.

The fan can then be put into operation again.



## 1.4 Cleaning

**Do not clean moving parts when the fan is in operation!**

Before cleaning the fan must be put out of operation. Ensure that the fan cannot be switched on again accidentally.

Only use suitable detergents and cleaning materials.

If material is sticking to the impeller or the impeller is worn, the fan may be seriously damaged by unbalance.

It is therefore recommended to clean and check the fan for unusual vibrations at regular intervals.

## 1.5 Electrical safety

The user has to ensure that the fan is only connected and serviced by a qualified electrician in accordance with the rules and regulations applying to electrical equipment.

The user must also ensure that the fan is operated in accordance with electro technical rules and regulations.

Do not touch/work on live parts.

- ✓ Interrupt the power supply to the fan and use mechanical means to ensure that power supply cannot be switched on again.
- ✓ Use a voltage tester to check that the circuit is dead.
- ✓ Connect and short the work site to earth.
- ✓ Only use the fuses indicated in the electric circuit diagram.
- ✓ Check the condition of the visible cables before the fan is started.
- ✓ Replace damaged cables.

Damaged and/or defective electrical equipment must be repaired or replaced immediately.

If the damaged equipment represents a risk, the fan may not be put into operation before the defect is repaired.

## 1.6 Description of labels and plates

The following plates are attached to the fan:

**1. Nameplate**

The nameplate indicates:

TYPE

COM. - NO.

YEAR OF CONSTRUCTION

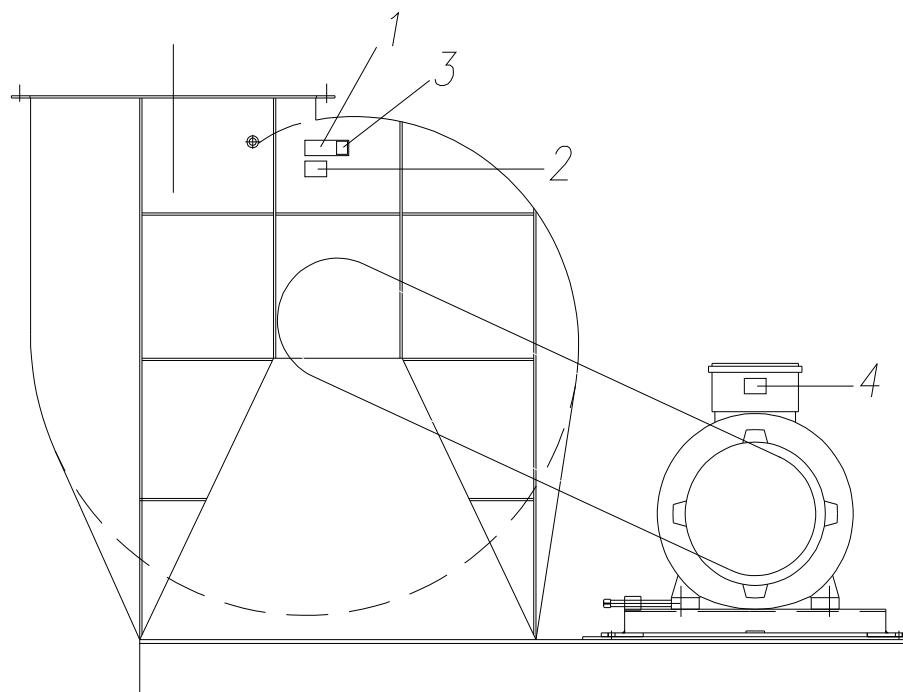
Further data are indicated on the master card of the fan.

**2. Arrow**

It shows the sense of rotation of the impeller.

**3. CE label**

**4. Motor nameplate**



## 2. Description

### 2.1 Design

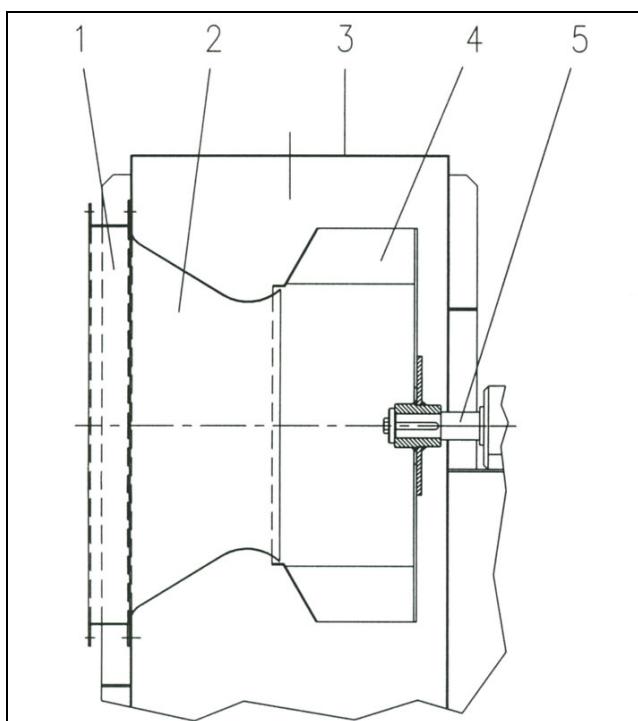
The fan is a welded single-stage centrifugal fan.

The propulsive power is transmitted by the motor shaft to the fan shaft via a drive belt. The fan shaft is supported in two antifriction bearings.

Each bearing shell has a lubricant replenishing device.

The motor is fitted on an additional sectional steel frame which can be installed on the left and right-hand sides of the fan, as desired.

In standard design the shaft seal is guaranteed for temperatures not exceeding +200 °C thanks to an asbestos-free flat packing.



1. *Inlet socket*
2. *Inlet cone*
3. *Casing*
4. *Impeller*
5. *Shaft*

## 3. Assembly and installation

### 3.1 Scope of supplies

When delivered the fan and accessories must be checked for damage.

Check that everything indicated on the delivery note has been delivered.

In all other respects please refer to our terms and conditions for sales and delivery.



### 3.2 Transport

Only transport the fan with transport facilities which are appropriate for the conditions on the site where the fan is to be installed.

Observe the applicable rules and regulations for the prevention of accidents. For lifting and transporting the fan only ropes and/or fork lift tracks with a sufficient lifting capacity may be used.

Only attach ropes to the fastening plates especially provided for lifting the fan. Do not use the eyelet on the motor for transporting the fan.

Warranty claims or claims for compensation for any damage caused by the use of unsuitable means of transport or caused by improper handling will not be accepted.

### 3.3 Storage

If the fan is not installed and/or put into operation immediately it must be stored in a dry place. In case of long-term storage please note the storage and preservation instructions for motors and fans.

### 3.4 Installation site

The installation site must be level and have a sufficient load bearing capacity. There must be enough room for assembly and maintenance work. The impeller must be easily accessible.

### 3.5 Pipes connected to the fan

When attaching the pipes to the fan care must be taken that the fan is not distorted.

- ✓ Remove the transport shutters from the connection ports.
- ✓ Connect the pipes with flexible connections to the inlet and outlet ports of the fan.

### 3.6 Electrical connection

The fan may only be connected up to the electrical system by a qualified electrician.

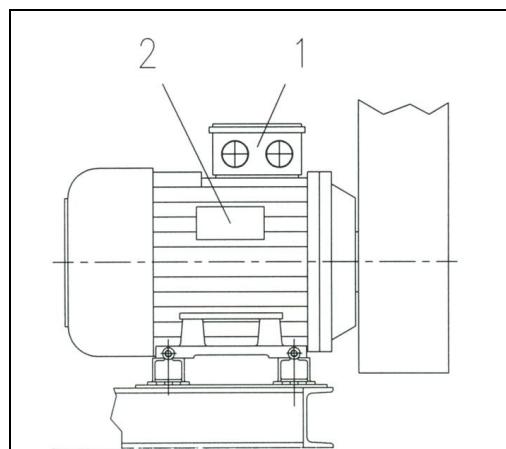
The drive motors are usually installed in the manufacturing works.

If the customer installs the motor, the warranty is submitted to a correct installation.

The motor is connected in accordance with the circuit diagram inside the terminal box (1).

The customer has to check that his power network and the switchgear and monitoring devices are sufficiently dimensioned to cope with the transient behaviour and current peaks. It must be ensured that the supply of cooling air to the electric motor is not hindered.

- ✓ The power supply cable for the fan must be installed in accordance with any locally applicable legal stipulations.
- ✓ Compare the local mains voltage with the voltage indicated on the rating plate (2) of the fan.
- ✓ Connect the fan as shown on the circuit diagram inside the terminal box (1).
- ✓ Earth the fan in accordance with the regulations issued by the local power supply company.
- ✓ Check the speed and sense of rotation.
- ✓ Check the transient behaviour and starting time.
- ✓ Provide for a motor protection system.



## 3.7 Inspection

### 3.7.1 Mechanical testing

Check the fan after it has been assembled and installed:

- ✓ check the attachment of the fan to the foundation;
- ✓ check if the impeller rotates freely;
- ✓ remove any foreign objects from the fan housing;
- ✓ check all screw couplings and bolted connections;
- ✓ check all pipe connections;
- ✓ check the grease fill of the bearings and check that bearings are correctly aligned.

### 3.7.2 Electrical testing

The electrical system of the fan may only be tested by a qualified electrician:

- ✓ check the operating voltage;



- ✓ check the earthing;
- ✓ check the size of the fuses.

If the fan is not put into operations immediately after it has been assembled and installed, it must be secured against unauthorized use and covered with a tarpaulin.

## 4. Start-up

### 4.1 Putting the fan into operation

The fan may only be put into operation by qualified and skilled staff. Before the fan is put into operation the staff must check that the fan is in good working order. The rules and regulations for putting electrical machines into operation must be observed:

- ✓ check the safety systems;
- ✓ close the damper or inlet vane control (if provided);
- ✓ switch on the master controller;
- ✓ switch on the fan.

The fan may only be switched on when the pipes are connected and when it is certain that there will be a sufficient plant resistance after the fan motor has reached its full operating speed:

- ✓ check the sense of rotation when the fan is started up for the first time (the fan must rotate in the direction indicated by the arrow);
- ✓ check the power consumption. The maximum permissible power consumption may not be exceeded;
- ✓ regularly check the bearings for unusual noises and check the temperature of the bearings in the first few operating hours;
- ✓ check the tension of the drive belt after 0,5 to 5 hours of operation and after 24 hours of full-load operation. Tension the belt if necessary.

### 4.2 Putting the fan out of operation

Switch off the fan.

## 4.3 Transient behaviour

### 4.3.1 General

The fan can only be started when a sufficiently high **moment of acceleration** is available from the moment it is started up to the moment when nominal speed is reached.

It is recommended to start the fan with the damper or inlet vane control closed (if provided).

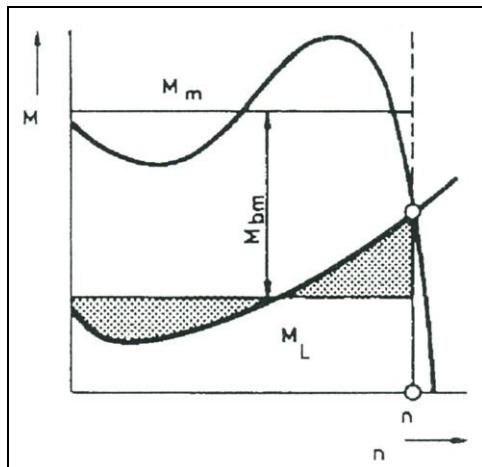
The customer has to check that his power network, switchgear, monitoring devices (if available) and cable cross sections are dimensioned to cope with the transient behaviour and current peaks.

### 4.3.2 Direct starting

Direct starting of the fan motor not only causes a high starting torque but also a high starting current.

**During starting the starting current may be 6 to 8 times as high as the nominal current (depending on the type of impeller).**

This high power input must be taken into account when the fuse sizes are determined.



$M_m$  Motor moment

$M_L$  Load moment

$M_{bm}$  Mean accelerating moment

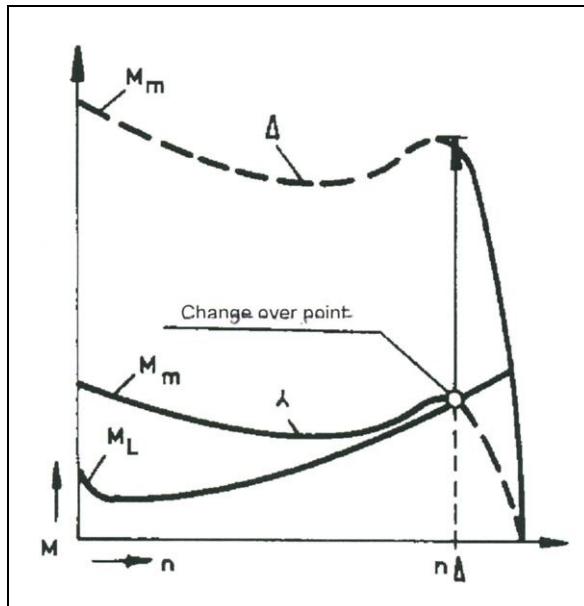
$n$  Speed

Designation of Mean accelerating moment

### 4.3.3 Star-delta starting

During star-delta starting the drive motor only provides for 1/3 of the starting torque in the star connection.

At a certain starting speed the load moment of the fan exceeds the starting torque of the motor. The motor does not accelerate. At this point the motor has to be changed over to the delta connection. The current peak which is then obtained is clearly lower than the one occurring during direct starting.



## 5. Care and maintenance

### 5.1 Lubrication

The fan must be checked at regular intervals (depending on the operating conditions).

#### 5.1.1 Drive motor

The motor must be serviced in accordance with the motor's lubricating instructions.

#### 5.1.2 Shaft bearings

The bearing housings are supplied with the necessary quantity of grease for the normal service.

During the first run period it is possible that bearings become hotter than normal, therefore it is necessary to lubricate the bearings after one operating week.

Afterwards, see the following diagram for the lubrication intervals.

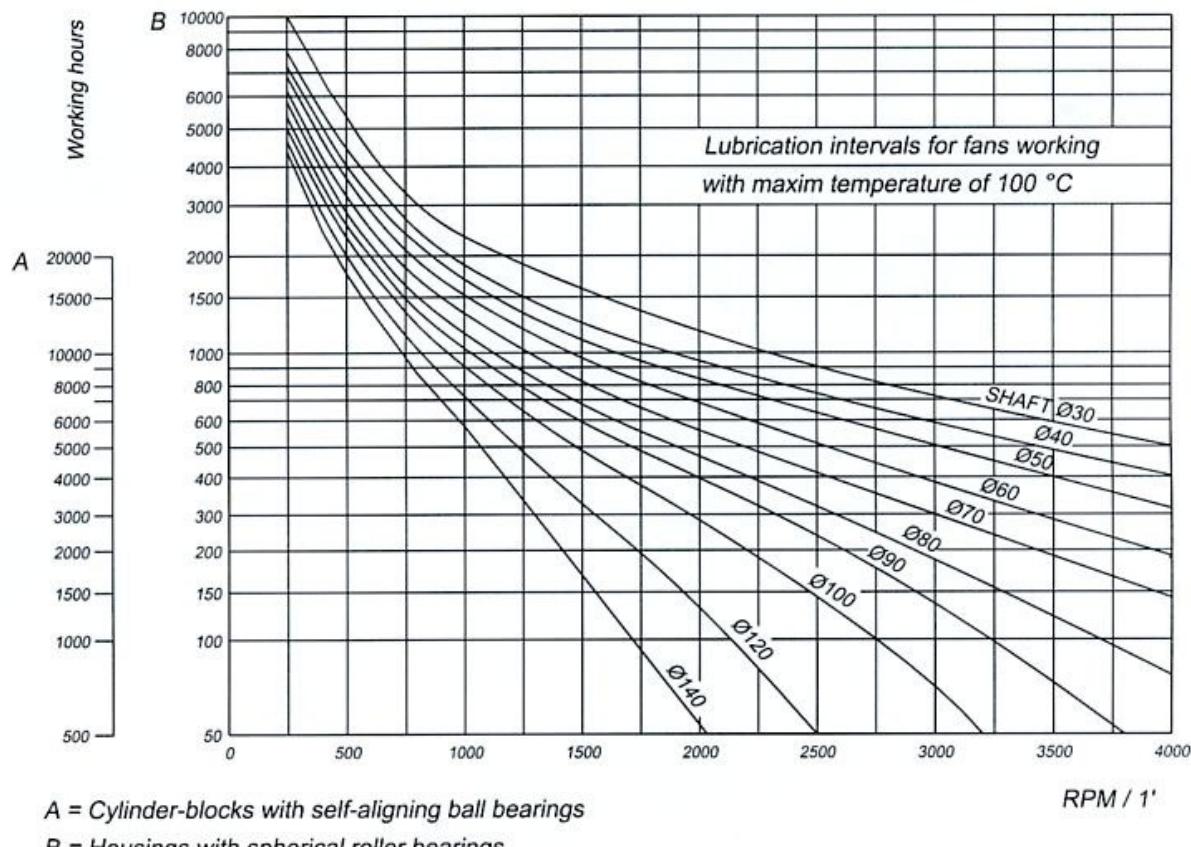
The lubrication intervals refer to fans working with air up to 100 °C.

For higher air temperature the intervals must be divided by the **K factor**.

The **K=2 factor** must be used for fan working in a dusty, wet, hot or corrosive atmosphere.

The quantity of grease for bearings lubrication is about 1/3 of the full capacity.

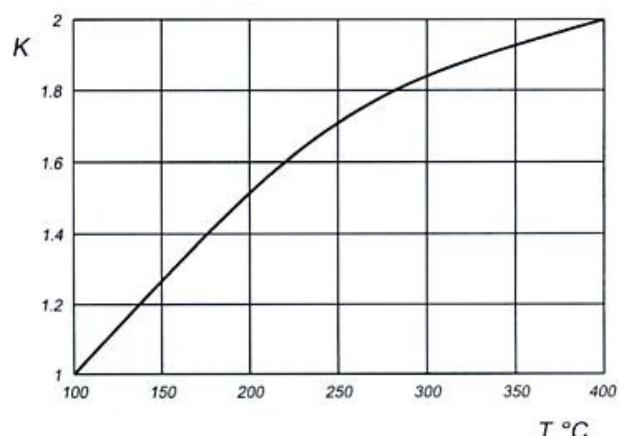
### 5.1.3 Lubrication intervals



*I* = Lubrication interval with temperature until 100° C

*I<sub>t</sub>* = Lubrication interval with temperature *T* °C

$$I_t = \frac{I}{K}$$



Quantity of grease *G* = 0,005 *D* x *B* (gr)

*D* = external ring diameter of the bearing

*B* = thickness of the bearing

Types of grease:

Esso Beacon EP-2

Shell Alvania EP-2

Agip GR/MU-EP-2

SKF EP-2

## 5.2 Drive belts

### 5.2.1. General

Before any general servicing work is started the fan must be turned off and it must be ensured that it cannot be switched on again.

Regularly inspect the drive belt.

Always replace the complete set of belts if one or several drive belts of a multiple-belt drive system fail.

Do not use different makes of drive belts in one set of belts.

Do not use belt dressing or belt spray.

Remove all deposits from the pulley rim.

### 5.2.2 Belt tension

Do not check the belt tension unless the fan is put out of operation.

Observe the safety instructions.

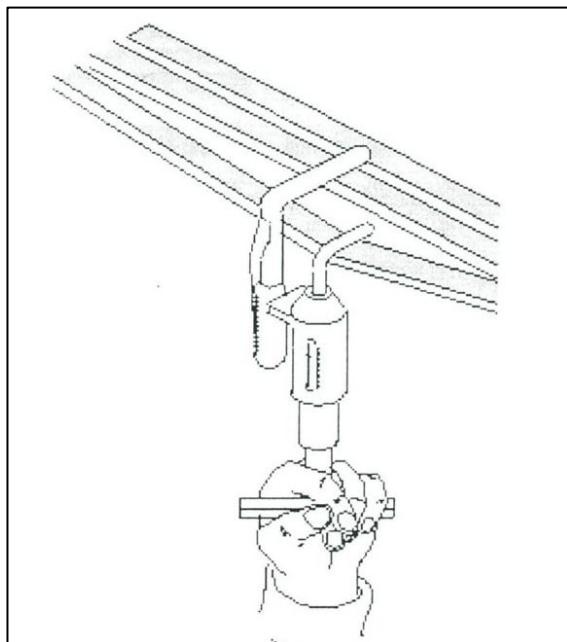
The belt housing must be removed for testing the belt tension.

Use a commercially available tension measuring instrument to determine the Ea deflection.

See an example of measuring method below.

Tension the belt if it can be pushed in (pulled out) too far.

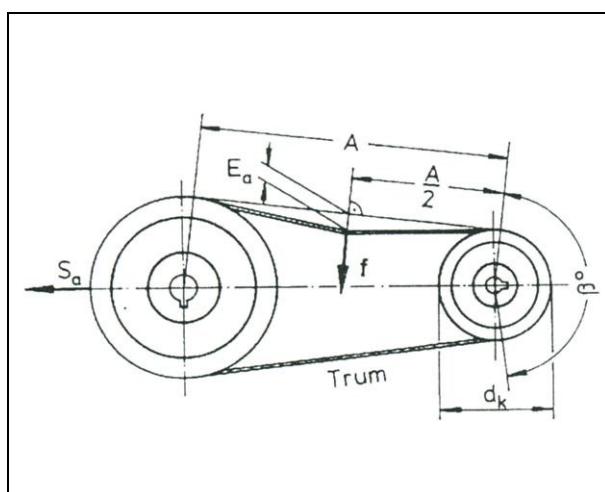
Install the belt housing before putting the fan into operation again.



## Guide values for belt tension

Guide values for the deflection of V-belts as a function of the applied testing force and the distance between pulley centres (simplified method).

Profile	Testing force per V-belt f (N)	Diameter of small pulley dk (mm)	Deflection of belt "Ea" in (mm)								
			With a distance between centres "A" in (mm)								
			500	630	800	1000	1250	1600	2000	2500	3150
<b>SPZ</b>	25	>100 ≤ 125	14	17	22	28	34	44	55	-	-
		>140 ≤ 160	13	16	20	25	31	40	50	63	-
		>180 ≤ 200	11	14	18	22	28	36	45	56	71
<b>SPA</b>	50	>180 ≤ 200	15	19	24	30	38	48	60	75	95
		>224 ≤ 250	13	16	20	25	31	40	50	63	79
<b>SBP</b>	75	>224 ≤ 250	15	19	24	30	38	48	60	75	95
		>280 ≤ 355	15	19	24	30	38	48	60	75	95
<b>SPC</b>	125	>315 ≤ 355	15	19	24	30	38	48	60	75	95
		400	14	17	22	28	34	44	55	69	87
		450	13	16	20	25	31	40	50	63	79
		500	11	14	18	22	28	36	45	56	71



*A = Distance between pulley centres in mm*

*f = Testing force per V-belt in N*

*E = Deflection per 100 mm distance between centres in mm*

*Ea = Deflection of the belt strand*

$$Ea \approx \frac{E \times A}{100} \text{ (mm)}$$

## 5.3 Troubleshooting

Trouble	Possible cause	Action
<b>Unsteady operation of fan</b>	Material sticking to impeller blades Worn impeller Impeller deformed by heat Fan distorted because of uneven foundation Strain exerted by connected pipes	Carefully clean impeller Replace impeller Replace impeller Remove fan from foundation and level foundation. Fasten fan to foundation again Use flexible pipe connections
<b>Fan produces a grinding noise</b>	Impeller rubs against inlet nozzle Motor noise Shaft bearings noise	Realign, check and correct pipe if necessary Check if bearings are damaged and replace bearings if necessary Check if bearings are damaged and replace them if necessary
<b>The power input indicated on the rating plate is constantly exceeded</b>	Too much air volume Different speed with 60 Hz mains	Reduce air volume using a damper until the permissible power input is reached Check frequency

### 5.3 Troubleshooting (cont'd)

Trouble	Possible cause	Action
<b>Fan does not accelerate</b>	Improper connection of drive motor Motor does not change from star to delta connection Fan operates against insufficient plant resistance Motor protection system is not strong enough Starting time is too long Faulty drive motor Starting/re-starting when fan is hot Starting current too high	Check connection Shorten change-over time from star to delta Close the dampers or install additional plate shutters Cable cross section and protective system must withstand starting current during acceleration Close the dampers, check starting torque of $M_A/M_N$ motor Check motor and replace if necessary Switching frequency too high, let motor run through (control via dampers) Wrong voltage. Provide star-delta starting, local mains not strong enough

## 5.3 Troubleshooting - Bearings

Trouble	Possible cause	Action
<b>Unsteady operating</b>	Damaged races and rolling elements	Replace bearing
	Excessive bearing clearance	Protect bearing against dirt
	Wear caused by dirt or insufficient lubrication	Use clean grease
<b>Unusual running noises:</b>		
<b>Whining or irregular noise</b>	Insufficient internal clearance	Use bearing with sufficient internal clearance
<b>Rattling or irregular noise</b>	Excessive internal clearance, damaged rolling surfaces, dirt	Replace bearing
	Wrong lubricant	Use correct lubricant
<b>Running noise is changing gradually</b>	Change of internal clearance caused by temperature changes, damaged raceway (e.g. by dirt or fatigue)	Protect bearing against heat

### 5.3 Troubleshooting - Drive belts

Trouble	Possible cause	Action
<b>Belt breaks shortly after installation (torn belt)</b>	Tensioning strand is damaged because of force applied during installation	Allow belt to be installed as indicated in the instructions
	Foreign objects cause damage during operating	Install a guard
	Blocked drive	Eliminate cause
<b>Cracked belt (embrittlement)</b>	Excessive heat	Eliminate radiant sources; shield off the belt; improve air circulation; shield off the drive
	Excessive cold	Use special type of belt
	Belt is slipping	Tension the belt as per instructions for mounting
<b>Strong vibrations</b>	Chemical attack	Use special type of belt
	Insufficient belt tension	Check tension and tension the belt if necessary
	Unbalanced belt pulleys	Balance the pulleys
<b>Twisted V-belts</b>	Pulleys are not aligned. Wrong belt/groove profile	Align pulleys. Match up belt and groove profile
	Heavily worn out pulley grooves	Replace pulleys
	Excessive vibration	Tension the drive
	Insufficient tension	Check tension and tension the belt if necessary

### 5.3 Trouble shooting - Drive belts (cont'd)

Trouble	Possible cause	Action
<b>Unusual wear of belt flanks</b>	Wrong groove angle	Re-machine or replace pulleys
	Worn out pulley grooves	Replace pulleys
	Wrong belt/groove profile	Match up belt and groove profile
	Pulleys are not aligned	Align pulleys
	Insufficient belt tension	Check tension and tension the belt if necessary
	Belt rubs against other parts	Remove the parts; re-align the drive
<b>Irregular noise</b>	Pulleys are not aligned	Align pulleys
	Insufficient belt tension	Check tension and tension the belt if necessary
	Drive is overloaded	Check drive ratios and adapt them to operating conditions
<b>Belt feels spongy and benzene sticky</b>	Belt is affected by oil, grease and chemicals	Clean pulleys with naphtha before new belts are installed
<b>Uneven elongation of the belt</b>	Faulty pulley grooves	Replace pulleys
	Set of belts consists of used and new belts	Always replace complete set of belts
	Set of belts consists of different belt makes	Only use one make of belts in a set of belts



## **PAINTING CERTIFICATE N. 1199**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER/JOB</b>	<b>120840 – JOB 2F11A – ITEM 64K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/B</b>
<b>DESCRIPTION AND TYPE</b>	<b>Centrifugal fan type GPR 19</b>

### **PREPARATION OF INTERNAL AND EXTERNAL SURFACES:**

Washing, grease removing and mechanics cleaning.

### **UNDERCOAT OF THE PARTS IN CARBON STEEL:**

N. 1 coat of synthetic paint thickness 40 microns.

### **FINISHING OF THE PARTS IN CARBON STEEL:**

N. 2 coats of paint RAL 7035 thickness 40 microns

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **PAINTING CERTIFICATE N. 1200**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER/JOB</b>	<b>120840 – JOB 2F11A – ITEM 64K2</b>
<b>OUR CONFIRMATION</b>	<b>85.12/C</b>
<b>DESCRIPTION AND TYPE</b>	<b>Centrifugal fan type GPR 48</b>

### **PREPARATION OF INTERNAL AND EXTERNAL SURFACES:**

Washing, grease removing and mechanics cleaning.

### **UNDERCOAT OF THE PARTS IN CARBON STEEL:**

N. 1 coat of synthetic paint thickness 40 microns.

### **FINISHING OF THE PARTS IN CARBON STEEL:**

N. 2 coats of paint RAL 7035 thickness 40 microns

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **PAINTING CERTIFICATE N. 1201**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER/JOB</b>	<b>120840 – JOB 2F11A – ITEM 64K3</b>
<b>OUR CONFIRMATION</b>	<b>85.12/D</b>
<b>DESCRIPTION AND TYPE</b>	<b>Centrifugal fan type GPH 52</b>

### **PREPARATION OF INTERNAL AND EXTERNAL SURFACES:**

Washing, grease removing and mechanics cleaning.

### **UNDERCOAT OF THE PARTS IN CARBON STEEL:**

N. 1 coat of synthetic paint thickness 40 microns.

### **FINISHING OF THE PARTS IN CARBON STEEL:**

N. 2 coats of paint RAL 7035 thickness 40 microns

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **PAINTING CERTIFICATE N. 1202**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER/JOB</b>	<b>120840 – JOB 2F11A – ITEM 64K4</b>
<b>OUR CONFIRMATION</b>	<b>85.12/E</b>
<b>DESCRIPTION AND TYPE</b>	<b>Centrifugal fan type RB 35</b>

### **PREPARATION OF INTERNAL AND EXTERNAL SURFACES:**

Washing, grease removing and mechanics cleaning.

### **UNDERCOAT OF THE PARTS IN CARBON STEEL:**

N. 1 coat of synthetic paint thickness 40 microns.

### **FINISHING OF THE PARTS IN CARBON STEEL:**

N. 2 coats of paint RAL 7035 thickness 40 microns

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **PAINTING CERTIFICATE N. 1203**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER/JOB</b>	<b>120840 – JOB 2F11A – ITEM 65K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/F</b>
<b>DESCRIPTION AND TYPE</b>	<b>Centrifugal fan type RB 19</b>

### **PREPARATION OF INTERNAL AND EXTERNAL SURFACES:**

Washing, grease removing and mechanics cleaning.

### **UNDERCOAT OF THE PARTS IN CARBON STEEL:**

N. 1 coat of synthetic paint thickness 40 microns.

### **FINISHING OF THE PARTS IN CARBON STEEL:**

N. 2 coats of paint RAL 7035 thickness 40 microns

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



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# BALLESTRA

## STANDARD QUALITY CONTROL PLAN

ISSUE					
Rev.	Description	Date	Drawn/Checked		Approved
4	Complete revision	02/01/07	Bernardini		Monari
3	Added burners section	27/07/06	Bernardini, Storti		Monari
2	Complete revision	09/12/03	Bernardini, Ruzzenenti		Monari
1	Complete revision	13/12/02	Lanzanova, Monari, Palumbo, Ruzzenenti		Monari
0	First issue	28/06/02	Lanzanova, Ruzzenenti		Farnetti



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LEGEND	3
Section 1	Centrifugal/ Dosing/ Volumetric Pumps/ Process Air Blowers
Section 1A	Centrifugal/ Dosing/ Volumetric Pumps/ Process Air Blowers
	Additional tests (Optional)
Section 2	Centrifugal Air Fans
Section 3	Non Pressure Vessels / Tanks
Section 3A	Non Pressure Vessels / Tanks - Additional test (Optional)
Section 4	Pressure Vessels
Section 4A	Pressure Vessels - Additional test (Optional)
Section 5	SO <sub>2</sub> -SO <sub>3</sub> Converters - SO <sub>2</sub> -SO <sub>3</sub> Exchangers
Section 6	Heat Exchangers
Section 7	Film Reactors
Section 8	High Speed Stirrers
Section 9	Rotating Mixers
Section 10	Wiped Film Evaporators
Section 11	Flakers
Section 12	Bag Filters
Section 13	Butterfly Valves (Ballestra design)
Section 14	Belt Conveyors / Screw Conveyors
Section 15	Chilling Groups
Section 16	Cooler Units
Section 17	Burners
Section 18	Computerized Control Systems
Section 19	Electric and Instrumentation Panel Boards
Section 20	Control Valves
Section 21	On-Off Valves
Section 22	Safety Valves
Section 23	Transmitters & Local Indicators
Section 24	Bulk Materials



# QUALITY SYSTEM PROCEDURE

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## SCOPE

This specification has the purpose to define the quality minimum requirement for "standard product" purchased by Ballestra. Are defined "standard" the products that are frequently purchased and for which exists a standardized design and construction system.  
The specific Quality Control Plans here attached (following called QCP) can be used by the suppliers as draft for the issues of dedicated QCP for different jobs.  
The minimum requirement listed in the attached QCP can be modified for some products, can be reduced or increased. In these cases the quality requirement will be specified in Ballestra design documentation (Material Requisition, Sketches, Data Sheet, etc.), or supplier documents (Specifications, QCP, etc.) previously approved by Ballestra.

## LEGEND

Abbreviation of Ballestra departments mentioned in this document:

ATI	Piping Design department
COL	Inspection department
GM	Shipment department
PRO	Process department
MAC	Machinery department
PES	Electrical / Instrumental Design department
PRS	Vessel Design department

Abbreviation of QCP steps Attend:

W	Witness Point	Written invite shall be sent from Supplier to Ballestra COL dept., in order to attend to this QCP step. Ballestra can renounce to attend to this step, the Supplier can continue his activities.
SW	Spot Witness Point	Written invite shall be sent from Supplier to Ballestra COL dept., in order to attend to this QCP step. Ballestra normally attend time to time to this step.
H	Hold Point	Written invite shall be sent from Supplier to Ballestra COL dept., in order to attend to this QCP step. Ballestra can renounce to attend to this step only by written answer, otherwise the Supplier cannot continue his activities.
R	Review	For these steps is foreseeing only a documentation review.

Remark:

All the written invitation shall be sent one week in advance from the test scheduled dates.



## QUALITY SYSTEM PROCEDURE

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### Section 2

#### Centrifugal Air Fans

S	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Report	Ballestra Attend	Dept	
1	Construction Drawing Approval	Equipment specification Data sheet	H		H	MAC	
2	Review of mill certificates	Design Code Ballestra Material Requisition UNI-ISO-VDI	H <del>S</del>	R	MAC		
3	Balancing test		H <del>Y</del>	Yes			
4	Vibration test		H <del>Y</del>	Yes	SW <del>COL</del>	<del>COL</del>	
5	Current Absorption check	Motor nameplate/Data Sheet	H <del>Y</del>	Yes	SW <del>COL</del>	<del>COL</del>	"CE" marking if required
6	Visual and dimensional check	Approved Data Sheet Construction drawing	H <del>Y</del>	Yes	SW <del>COL</del>	<del>COL</del>	
7	Nameplate Check	Ballestra Material Requisition	H	W	COL	<del>COL</del>	
8	Surfaces treatment/ Painting check	Manufacturer specification Ballestra Material Requisition	H	Yes	W	<del>COL</del>	
9	Accessories & Spare Parts	Ballestra Material Requisition	H	Yes	SW <del>COL</del>	<del>COL</del>	(Bellows, Inlet Valves, etc.)
10	Documents review	Applicable code Ballestra Material Requisition	H	Yes	R	MAC	

ORDER N. 120840

Jobs 2 FMA

ITEH 63KA

CENTRIFUGAL FAN PF 1418/A



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### Section 2

#### Centrifugal Air Fans

S	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Report	Ballestra Attend	Dept	
1	Construction Drawing Approval	Equipment specification Data sheet	H		H	MAC	
2	Review of mill certificates	Design Code Ballestra Material Requisition	H		R	MAC	
3	Balancing test	UNI-ISO-VDI	H	Yes			
4	Vibration test	Motor nameplate/Data Sheet	H	Yes	SW	COL	
5	Current Absorption check	Approved Data Sheet	H	Yes	SW	COL	
6	Visual and dimensional check	Construction drawing	H	Yes	SW	COL	"CE" marking if required
7	Nameplate Check	Ballestra Material Requisition	H		W	COL	
8	Surfaces treatment/ Painting check	Manufacturer specification Ballestra Material Requisition	H	Yes	W	COL	
9	Accessories & Spare Parts	Ballestra Material Requisition	H	Yes	SW	COL	(Bellows, Inlet Valves, etc.)
10	Documents review	Applicable code Ballestra Material Requisition	H	Yes	R	MAC	

Order N. 120840

Job 2F1A

ITEM 64KA

CENTRIFUGAL FAN GRP. A



## QUALITY SYSTEM PROCEDURE

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### Section 2

#### Centrifugal Air Fans

Step	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Attend	Ballestra Dept	Third Party Report	
1	Construction Drawing Approval	Equipment specification Data sheet	H		H	MAC	
2	Review of mill certificates	Design Code Ballestra Material Requisition	H		R	MAC	
3	Balancing test	UNI-ISO-VDI	H	Yes			
4	Vibration test	VDI	H	Yes	SW	COL	
5	Current Absorption check	Motor nameplate/Data Sheet	H	Yes	SW	COL	
6	Visual and dimensional check	Approved Data Sheet Construction drawing	H	Yes	SW	COL	
7	Nameplate Check	Ballestra Material Requisition	H		W		"CE" marking if required
8	Surfaces treatment/ Painting check	Manufacturer specification Ballestra Material Requisition	H	Yes	W		
9	Accessories & Spare Parts	Ballestra Material Requisition	H	Yes	SW	COL	(Bellows, Inlet Valves, etc.)
10	Documents review	Applicable code Ballestra Material Requisition	H	Yes	R	MAC	

ORDER N. 120840

JOB 2F114

ITEM 64K2

CENTRIFUGAL FAN GRN 48



## QUALITY SYSTEM PROCEDURE

IOQ-010

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### Section 2

#### Centrifugal Air Fans

S#	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Report	Ballestra Attend	Dept	
1	Construction Drawing Approval	Equipment specification Data sheet	H		H	MAC	
2	Review of mill certificates	Design Code Ballestra Material Requisition	H		R	MAC	
3	Balancing test	UNI-ISO-VDI	H	Yes			
4	Vibration test	VDI	H	Yes	SW	COL	
5	Current Absorption check	Motor nameplate/Data Sheet	H	Yes	SW	COL	
6	Visual and dimensional check	Approved Data Sheet Construction drawing Ballestra Material Requisition	H	Yes	SW	COL	2/10/03
7	Nameplate Check	Ballestra Material Requisition	H		W	COL	"CE" marking if required
8	Surfaces treatment/ Painting check	Manufacturer specification Ballestra Material Requisition	H	Yes	W	COL	
9	Accessories & Spare Parts	Ballestra Material Requisition	H	Yes	SW	COL	(Bellows, Inlet Valves, etc.)
10	Documents review	Applicable code Ballestra Material Requisition	H	Yes	R	MAC	

Order N. 120840

Doc 2 FMA

ITEM 64K3

CENTRIFUGAL FAN GPH 52



## QUALITY SYSTEM PROCEDURE

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### Section 2

#### Centrifugal Air Fans

Step	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Report	Ballestra Attend	Dept	
1	Construction Drawing Approval	Equipment specification Data sheet	H	H	R	MAC	
2	Review of mill certificates	Design Code Ballestra Material Requisition	H	H	Yes	COL	
3	Balancing test	UNI-ISO-VDI	H	Yes	SW	COL	
4	Vibration test	VDI	H	Yes	SW	COL	
5	Current Absorption check	Motor nameplate/Data Sheet Approved Data Sheet	H	Yes	SW	COL	
6	Visual and dimensional check	Construction drawing Ballestra Material Requisition	H	Yes	SW	COL	"CE" marking if required
7	Nameplate Check	Ballestra Material Requisition	H	W	COL	COL	
8	Surfaces treatment/ Painting check	Manufacturer specification Ballestra Material Requisition	H	Yes	W	COL	
9	Accessories & Spare Parts	Ballestra Material Requisition Applicable code	H	Yes	SW	COL	(Bellows, Inlet Valves, etc.)
10	Documents review	Ballestra Material Requisition	H	Yes	R	MAC	

Order N. 120840

Job 2 FMA

ITEM 6414

CENTRIFUGAL FAN RB 35



## QUALITY SYSTEM PROCEDURE

IQQ-010

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### Section 2

#### Centrifugal Air Fans

Seq	Description	Reference Documents	Inspection				Notes
			Manufacturer Test	Report	Ballestra Attend	Dept	
1	Construction Drawing Approval	Equipment specification Data sheet	H	H	MAC		
2	Review of mill certificates	Design Code Ballestra Material Requisition	H	R	MAC		
3	Balancing test	UNI-ISO-VDI	H	Yes			
4	Vibration test	Motor nameplate/Data Sheet	H	Yes	SW	COL	
5	Current Absorption check	Approved Data Sheet Construction drawing	H	Yes	SW	COL	
6	Visual and dimensional check	Ballestra Material Requisition	H	W	COL		"CE" marking if required
7	Nameplate Check	Manufacturer specification Material Requisition	H	W	COL		
8	Surfaces treatment/ Painting check	Ballestra Material Requisition	H	Yes	W	COL	
9	Accessories & Spare Parts	Applicable code Ballestra Material Requisition	H	Yes	SW	COL	(Bellows, Inlet Valves, etc.)
10	Documents review		H	Yes	R	MAC	

ONDE N. 120 & 40

TOS 2FAA

ITEM 65K1

CENTRIFUGAL FAN NB 19



## **SOUND LEVEL CERTIFICATE N. 1187**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 63K1

**OUR CONFIRMATION** 85.12/A

**CENTRIFUGAL FAN TYPE** PF 17/8/A

**SOUND PRESSURE LEVEL** 77db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **SOUND LEVEL CERTIFICATE N. 1188**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K1

**OUR CONFIRMATION** 85.12/B

**CENTRIFUGAL FAN TYPE** GPR 19

**SOUND PRESSURE LEVEL** 82db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **SOUND LEVEL CERTIFICATE N. 1189**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K2

**OUR CONFIRMATION** 85.12/C

**CENTRIFUGAL FAN TYPE** GPR 48

**SOUND PRESSURE LEVEL** 82db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## SOUND LEVEL CERTIFICATE N. 1190

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K3

**OUR CONFIRMATION** 85.12/D

**CENTRIFUGAL FAN TYPE** GPH 52

**SOUND PRESSURE LEVEL** 82db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## **SOUND LEVEL CERTIFICATE N. 1191**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K4

**OUR CONFIRMATION** 85.12/E

**CENTRIFUGAL FAN TYPE** RB 35

**SOUND PRESSURE LEVEL** 82db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## SOUND LEVEL CERTIFICATE N. 1192

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 65K1

**OUR CONFIRMATION** 85.12/F

**CENTRIFUGAL FAN TYPE** RB 19

**SOUND PRESSURE LEVEL** 82db(A) + 3 tolerance

The sound level value should be read at a distance of 1,5 meter from the fan in free field according to **UNI ISO 3746 - 2.2** standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 63K1
Type	PF 17/8/A
Class	II
Arrangement	4
Discharge position	RO 3
Drawing	PF.12.0187
Accessories	<b>Bolts and gaskets</b> <b>Shaft seal</b> <b>N. 2 counterflanges</b> <b>Inspection door</b> <b>Drain connection</b> <b>Rubber isolators type "CSP"</b>
Design data	<b>Capacity:</b> 2.500 mc/h at 55 °C <b>Static pressure:</b> 200 mm at 55 °C <b>Total pressure:</b> 211 mm at 55 °C <b>Rpm:</b> 2.900/1' <b>Absorbed power:</b> 2 Kw. at 55 °C  <b>Electric motor 4 Kw. - 2 poles - 50 Hz . - B 3</b>



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 64K1
Type	GPR 19
Class	III
Arrangement	1
Discharge position	RA 1
Drawing	GPR.12.0188-REV.1
Accessories	<b>Bolts and gaskets</b> <b>Shaft seal</b> <b>N. 2 counterflanges</b> <b>N. 2 flexible connections type 3</b> <b>Inspection door</b> <b>Drain connection</b> <b>Base frame</b> <b>Rubber isolators type "CSP"</b> <b>V-belt drive - Slide rails</b> <b>Belt guard</b>
Design data	<b>Capacity:</b> 11.300 mc/h at 35 °C <b>Static pressure:</b> 250 mm at 35 °C <b>Total pressure:</b> 267 mm at 35 °C <b>Rpm:</b> 2.830/1' <b>Absorbed power:</b> 10,4 Kw. at 35 °C  <b>Electric motor 15 Kw. - 2 poles - 50 Hz . - B 3</b>



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 64K2
Type	GPR 48
Class	III
Arrangement	1
Discharge position	RA 1
Drawing	GPR.12.0189
Accessories	<p>Shaft in C45 Bolts and gaskets Shaft seal N. 2 counterflanges in AISI 304 N. 2 flexible connections type 3C Inspection door Drain connection Base frame Rubber isolators type "CSP" Slide rails - V-belt drive Belt guard</p>
Design data	<p>Capacity: 69.565 mc/h at 35 °C Static pressure: 200 mm at 35 °C Total pressure: 219 mm at 35 °C Rpm: 1.100/1' Absorbed power: 51,5 Kw. at 35 °C</p> <p>Electric motor 75 Kw. - 4 poles - 50 Hz . - B 3</p>



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 64K3
Type	GPH 52
Class	IV
Arrangement	1
Discharge position	RO 3
Drawing	GPH.12.0190
Accessories	<p>Coverting casing thickness 70 mm by you Bolts and gaskets Shaft seal N. 2 counterflanges N. 1 inlet flexible connection type 3C Inspection door covered Drain connection Shaft cooler Base frame Rubber isolators type "CP" Slide rails - V-belt drive Belt guard</p>
Design data	<p>Capacity: 100.000 mc/h at 100 °C Static pressure: 300 mm at 100 °C Total pressure: 320 mm at 100 °C Rpm: 1.220/1' Absorbed power: 104,1 Kw. at 100 °C</p> <p>Electric motor 160 Kw. - 4 poles - 50 Hz . - B 3</p>



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 64K4
Type	RB 35
Class	III
Arrangement	1
Discharge position	RO 3
Drawing	RB.12.0191
Accessories	<b>Bolts and gaskets</b> <b>Shaft seal</b> <b>N. 2 counterflanges</b> <b>N. 1 inlet flexible connection type 3C</b> <b>Inspection door</b> <b>Drain connection</b> <b>Shaft cooler</b> <b>Base frame</b> <b>Rubber isolators type "CSP"</b> <b>Slide rails - V-belt drive</b> <b>Belt guard</b>
Design data	<b>Capacity:</b> 29.000 mc/h at 45 °C <b>Static pressure:</b> 350 mm at 45 °C <b>Total pressure:</b> 397 mm at 45 °C <b>Rpm:</b> 1.660/1' <b>Absorbed power:</b> 37,3 Kw. at 100 °C  <b>Electric motor 55 Kw. - 4 poles - 50 Hz . - B 3</b>



## TECHNICAL CARD

Your order	120840
Job	2F11A - ITEM 65K1
Type	RB 19
Class	III
Arrangement	1
Discharge position	RA 1
Drawing	RB.12.0193
Accessories	<b>Bolts and gaskets</b> <b>Shaft seal</b> <b>N. 2 counterflanges</b> <b>N. 2 flexible connections type 3C</b> <b>Inspection door</b> <b>Drain connection</b> <b>Base frame</b> <b>Rubber isolators type "CSP"</b> <b>Slide rails - V-belt drive</b> <b>Belt guard</b>
Design data	<b>Capacity:</b> 7.100 mc/h at 35 °C <b>Static pressure:</b> 300 mm at 35 °C <b>Total pressure:</b> 332 mm at 35 °C <b>Rpm:</b> 2.740/1' <b>Absorbed power:</b> 8 Kw. at 35 °C  <b>Electric motor 55 Kw. - 4 poles - 50 Hz . - B 3</b>



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Part. IVA 00748610961  
Cod. Fisc. 03331410153  
C.C.I.A.A. Milano 951510  
Reg. Trib. Monza 12972

## VENTILATORI CENTRIFUGHI E ASSIALI

### TESTING CERTIFICATE N.1193

DATE, 11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 ITEM: 63K1

CONFIRMATION: 85.12/A

FAN TYPE: PF 17/8/A CLASS: II

ARRANGEMENT: 4 DISCHARGE POSITION: RO 3

#### CHARACTERISTICS

CAPACITY: 2.500 mc/h a 55°C

STATIC PRESSURE: 200 mm. A 55°C

TOTAL PRESSURE: 211 mm. A 55°C

VELOCITY: 2.900/1'

ABSORBED POWER: 2 Kw. A 20°C

MOTOR PULLEY: FAN PULLEY: BELTS:

SUPPORTS:

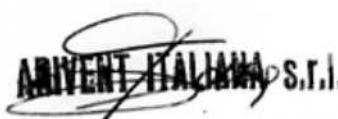
#### MOTOR

TYPE: ADA 112M RATED AMP: 7,36

KW: 4 TESTING AMP: 2,9

POLES: 2 STARTING AMP: 63,3

RPM: 2.983 VOLT/HZ: 50 HZ.

  
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## VENTILATORI CENTRIFUGHI E ASSIALI

TESTING CERTIFICATE N.1194

DATE,

11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 ITEM: 64K1

CONFIRMATION: 85.12/B

FAN TYPE: GPR 19 CLASS: II

ARRANGEMENT: 1 DISCHARGE POSITION: RA1

### CHARACTERISTICS

CAPACITY: 11.300 mc/h a 35°C

STATIC PRESSURE: 250 mm. A 35°C

TOTAL PRESSURE: 267 mm, a 35°C

VELOCITY: 2.830/1'

ABSORBED POWER: 10,4 Kw. a 35°C

MOTOR PULLEY: 132X3SPA FAN PULLEY: 132X3SPA BELTS: N.3SPA 1932

SUPPORTS: ENBLOCK OMB 45N

### MOTOR

TYPE: A-DA 160MB RATED AMP: 26,9

KW: 15 TESTING AMP: 14

POLES: 2 STARTING AMP: INVERTER

RPM: 2.947 VOLT/HZ: 50 HZ

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## VENTILATORI CENTRIFUGHI E ASSIALI

TESTING CERTIFICATE N.1195

DATE,

11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 - JOB 2F11A ITEM: 64K2

CONFIRMATION: 85.12/C

FAN TYPE: GPR 48 CLASS: III

ARRANGEMENT: 1 DISCHARGE POSITION: RA 1

### CHARACTERISTICS

CAPACITY: 69.565 mc/h a 35°C

STATIC PRESSURE: 200 mm a 35°C

TOTAL PRESSURE: 219 mm a 35°C

VELOCITY: 1.100/1'

ABSORBED POWER: 51,6 Kw a 35°C

MOTOR PULLEY: 280X4SPC FAN PULLEY: 375X4SPC BELTS: N.4SPC 4250

SUPPORTS: N.2 SNL 519

### MOTOR

TYPE: AU-DF280S RATED AMP: 78,5 Motore prova

KW: 75 TESTING AMP: 34

POLES: 4 STARTING AMP: Avviato con inverter

RPM: 975 VOLT/HZ: 50 HZ.

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## VENTILATORI CENTRIFUGHI E ASSIALI

TESTING CERTIFICATE N.1196

DATE,

11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 - JOB 2F11A ITEM: 64K3

CONFIRMATION: 85.12/D

FAN TYPE: GPH 52 CLASS: IV

ARRANGEMENT: 1 DISCHARGE POSITION: R0 3

### CHARACTERISTICS

CAPACITY: 100.000 mc/h a 100°C

STATIC PRESSURE: 300 mm a 100°C

TOTAL PRESSURE: 320 mm a 100°C

VELOCITY: 1.220/1'

ABSORBED POWER: 104,1 Kw a 100°C

MOTOR PULLEY: 375X6SPC FAN PULLEY: 450X6SPC BELTS: N.6 SPC 4750

SUPPORTS: N. 2 SNL 524

### MOTOR

TYPE: AU-DF250MA RATED AMP: 78,5 Motore prova

KW: 160 TESTING AMP: 35

POLES: 4 STARTING AMP: Inverter

RPM: 820 VOLT/HZ: 50 HZ.

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Reg. Trib. Monza 12972

## VENTILATORI CENTRIFUGHI E ASSIALI

TESTING CERTIFICATE N.1197

DATE,

11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 - JOB 2F11A ITEM: 64K4

CONFIRMATION: 85.12/E

FAN TYPE: RB 35 CLASS: III

ARRANGEMENT: 1 DISCHARGE POSITION: R0 3

### CHARACTERISTICS

CAPACITY: 29.000 mc/h a 45°C

STATIC PRESSURE: 350 mm a 45°C

TOTAL PRESSURE: 397 mm a 45°C

VELOCITY: 1.660/1'

ABSORBED POWER: 37,3 Kw a 45°C

MOTOR PULLEY: 280X4SPB FAN PULLEY: 250X4SPB BELTS: N.4 SPB 3170

SUPPORTS:

### MOTOR

TYPE: AU-DF250MA RATED AMP: 97,5

KW: 55 TESTING AMP: 37

POLES: 4 STARTING AMP: Avviato con inverter

RPM: 1.663 VOLT/HZ: 50 HZ

  
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**ARIVENT ITALIANA** S.R.L.

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Cap. Soc. € 50.980,00  
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Cod. Fisc. 03331410153  
C.C.I.A.A. Milano 951510  
Reg. Trib. Monza 12972

## VENTILATORI CENTRIFUGHI E ASSIALI

TESTING CERTIFICATE N.1198

DATE,

11/09/2012

CUSTOMER: DESMET BALLESTRA S.P.A.

ORDER: 120840 - JOB 2F11A ITEM: 65K1

CONFIRMATION: 85.12/F

FAN TYPE: RB 19 CLASS: II

ARRANGEMENT: 1 DISCHARGE POSITION: RA 1

### CHARACTERISTICS

CAPACITY: 7.100 mc/h a 35°C

STATIC PRESSURE: 300 mm a 35°C

TOTAL PRESSURE: 332 mm a 35°C

VELOCITY: 2.740/1'

ABSORBED POWER: 8 Kw a 35°C

MOTOR PULLEY: 112X3SPA FAN PULLEY: 118X3SPA BELTS: N.3 SPA 1857

SUPPORTS:

### MOTOR

TYPE: A-DA 160MA RATED AMP: 19,2

KW: 11 TESTING AMP: 11

POLES: 2 STARTING AMP: Inverter

RPM: 2.812 VOLT/HZ: 50 HZ



ARIVENT ITALIANA S.R.L.



**VIBRATIONS CERTIFICATE N. 1181**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 63K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/A</b>
<b>CENTRIFUGAL FAN TYPE</b>	<b>PF 17/8/A</b>

Fan vibrations according to ISO 10816 – 2.2 standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



**VIBRATIONS CERTIFICATE N. 1182**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K1</b>
<b>OUR CONFIRMATION</b>	<b>85.12/B</b>
<b>CENTRIFUGAL FAN TYPE</b>	<b>GPR 19</b>

Fan vibrations according to ISO 10816 – 2.2 standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



**VIBRATIONS CERTIFICATE N. 1183**

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K2</b>
<b>OUR CONFIRMATION</b>	<b>85.12/C</b>
<b>CENTRIFUGAL FAN TYPE</b>	<b>GPR 48</b>

Fan vibrations according to ISO 10816 – 2.2 standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



**VIBRATIONS CERTIFICATE N. 1184**

**CUSTOMER** DESMET BALLESTRA S.P.A.

**YOUR ORDER** 120840 – JOB 2F11A – ITEM 64K3

**OUR CONFIRMATION** 85.12/D

**CENTRIFUGAL FAN TYPE** GPH 52

Fan vibrations according to ISO 10816 – 2.2 standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL



## VIBRATIONS CERTIFICATE N. 1185

<b>CUSTOMER</b>	<b>DESMET BALLESTRA S.P.A.</b>
<b>YOUR ORDER</b>	<b>120840 – JOB 2F11A – ITEM 64K4</b>
<b>OUR CONFIRMATION</b>	<b>85.12/E</b>
<b>CENTRIFUGAL FAN TYPE</b>	<b>RB 35</b>

Fan vibrations according to ISO 10816 – 2.2 standard.

**Bovisio Masciago, July 31, 2012**

**ARIVENT ITALIANA SRL**



## VIBRATIONS CERTIFICATE N. 1186

CUSTOMER	DESMET BALLESTRA S.P.A.
YOUR ORDER	120840 – JOB 2F11A – ITEM 65K1
OUR CONFIRMATION	85.12/F
CENTRIFUGAL FAN TYPE	RB 19

Fan vibrations according to ISO 10816 – 2.2 standard.

Bovisio Masciago, July 31, 2012

ARIVENT ITALIANA SRL