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(HINE)

AX.02.70.9002.00

Trenitalia Cooling System Design Document

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1. ISSUE CONTROL AND DISTRIBUTION

ISSUE CONTROL

ISSUE	REASON	DATE
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	DESIGN REPORT - COOLING SYSTEM CAF P&A (TRENITALIA PROJECT)	Ref. Doc.: E-1618
		<i>Revision:</i> -
		<i>Date:</i> 23/02/2016

DESIGN REPORT - COOLING SYSTEM CAF P&A (TRENITALIA PROJECT)

Rev	Date	Author	Description
-	23.02.2016	AAOL	Initial release
A	29.02.2016	AAOL	Point 3.1; 4.1 and 5.1 modified.
B			
C			
D			



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1 INTRODUCTION

CAF P&A sets a Purchase Order Nº 4114/029059 to HINE S.A. for the design and manufacturing of two cooling systems for the electric converter of a locomotive.

This project is named as Trenitalia project and final destination is Italia,

HINE's job number for the referred project is OF-154080.

2 OBJECTIVE

Present report is a design report that will cover all relevant engineering information concerning the project.

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3 INITIAL DATA

As some spare elements from the cooling system are purchased by CAF P&A, data is already given by CAF P&A.

3.1 Basic given data

Parameter	Value
Cooling capacity required	25kW per cooling system / 100 kW per locomotive
Fluid:	60% Water and 40% Glycol. For example, Antifrogen N 40% or similar.
Flow:	$Q \geq 75\text{ l/min}$
T water in (to cabinet)	56 °C (max)
T air in (to cooler fan)	45 °C
Pressure drop (estimated)	2 bar

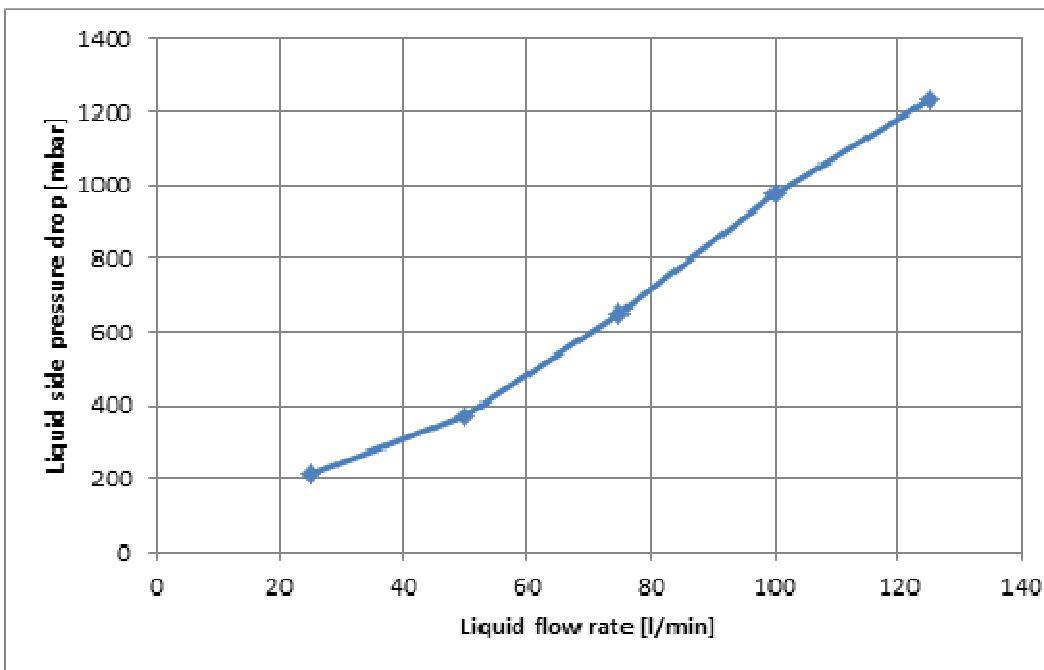
3.2 Cooler

The cooler is **Customer supply**. The information regarding the cooler is partial:

Existing data of cooler efficiency with oil as a cooling fluid:

Description	Value
Heat dissipation Power	25W
T air inlet	45°C
T air outlet	51.2°C
T oil inlet	60°C
T oil outlet	54.5°C
Oil flow	75 l/min
Pressure drop (oil)	0.65bar
Ambient humidity	60%
Air flow	3.6m³/s

Pressure drop calculations with water-glycol fluid (according to following graph):



NOTE: Pressure losses curve including connector in/out Staubli RME 20.1155/JS3 + RME 20.7155/JS3

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4 BASIC CALCULATIONS

4.1 Water-glycol temperature rise calculation

Water glycol flow is $Q \geq 75\text{ l/min}$. And heat power is 25kW.

Calculations are done at limit condition (most critical) with maximum allowable water glycol inlet temperature (56°C). At 56 °C fluid density and specific heat are the following:

Density (40% mix @ 56 °C) = 1,055 Kg/l

Specific heat (40% mix @ 56 °C) = 3,55 kJ/Kg*K

Therefore, temperature rise can be calculated:

$$25\text{ kW} = 75 \text{ [l/min]} * 1,055 \text{ [Kg/l]} * 1/60 \text{ [min/s]} * 3,55 \text{ [kJ/Kg*K]} * (X-56)[\text{K}]$$

T water IN = 56 °C

T water OUT = 61,34 °C approximately

ΔT water = 5,34 °C

4.2 Cooler air temperature rise calculation

Data corresponding to the cooler is very limited. But the air flow is known and therefore the air temperature rise can be calculated approximately:

Based in the air mass flow data given ($3,6 \text{ m}^3/\text{s}$), we can do same calculation:

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For T air IN = 45°C

Mass flow = 3,6 m³/s

Specific Heat of air at 45°C = 1,008 KJ/Kg*K (aprox)

$$25\text{kW} * 1000 [\text{W/kW}] = 3,6 [\text{m}^3/\text{s}] * 1000 [\text{l/m}^3] * 1,008 [\text{kJ/Kg*K}] * (X-45)[\text{K}]$$

T air IN = 45 °C

T air OUT = 51,9 °C approximately

ΔT air = 6,9 °C

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5 COOLER SIZING

5.1 With the existing data

In this project, the cooler is customer supplied but the data corresponding to the cooling capacity for the refereed fluid and flow is known.

Specific cooling capacity of the cooler is measured as the amount of kW the cooler can dissipate at a certain flow for every °C difference between hot fluid entering temperature and cool air entering temperature.

$$\Delta T = T \text{ water OUT} - T \text{ air IN} = 61,34 \text{ °C} - 45 \text{ °C} = 16,34 \text{ °C}$$

Heat power = 25 kW

Specific cooling capacity required = $25 / 16,34 = 1,53 \text{ kW/°C}$

That specific cooling capacity for water glycol can be achieved by the cooler proposed by the customer:

Performance

Water cooler

Ambient temperature: 45°C.

Ambient pressure: 101325 Pa (0 m).

<u>Parameters</u>	<u>Request</u>	<u>TESIO CS Proposal</u>
Heat Rejection dirty [kW]	25	25
Cooling capacity [kW/K]	-	1.7
Fouling	10%	10%
Coolant Type	Water 60% + glycol 40%	
Coolant Flow [l/min]	75	75
Coolant Inlet Temperature [°C]	63	60
Coolant Outlet Temperature [°C]	56	54.5
Coolant pressure drop [mbar]	-	450
Air Flow [m³/s]	3.6	3.6
Air Inlet Temperature [°C]	45	45
Air Outlet Temperature [°C]	-	51.2
Air Side Pressure Drop [Pa]	-	560



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So, with the known values of the cooler selected by the customer, we will get the water outlet temperature:

$$T_{\text{water IN}} [^{\circ}\text{C}] - 45 [^{\circ}\text{C}] = (25 \text{kW} / 1.7 [\text{kW/K}])$$

$$\mathbf{T_{\text{water IN}} = 59,71 [^{\circ}\text{C}]}$$

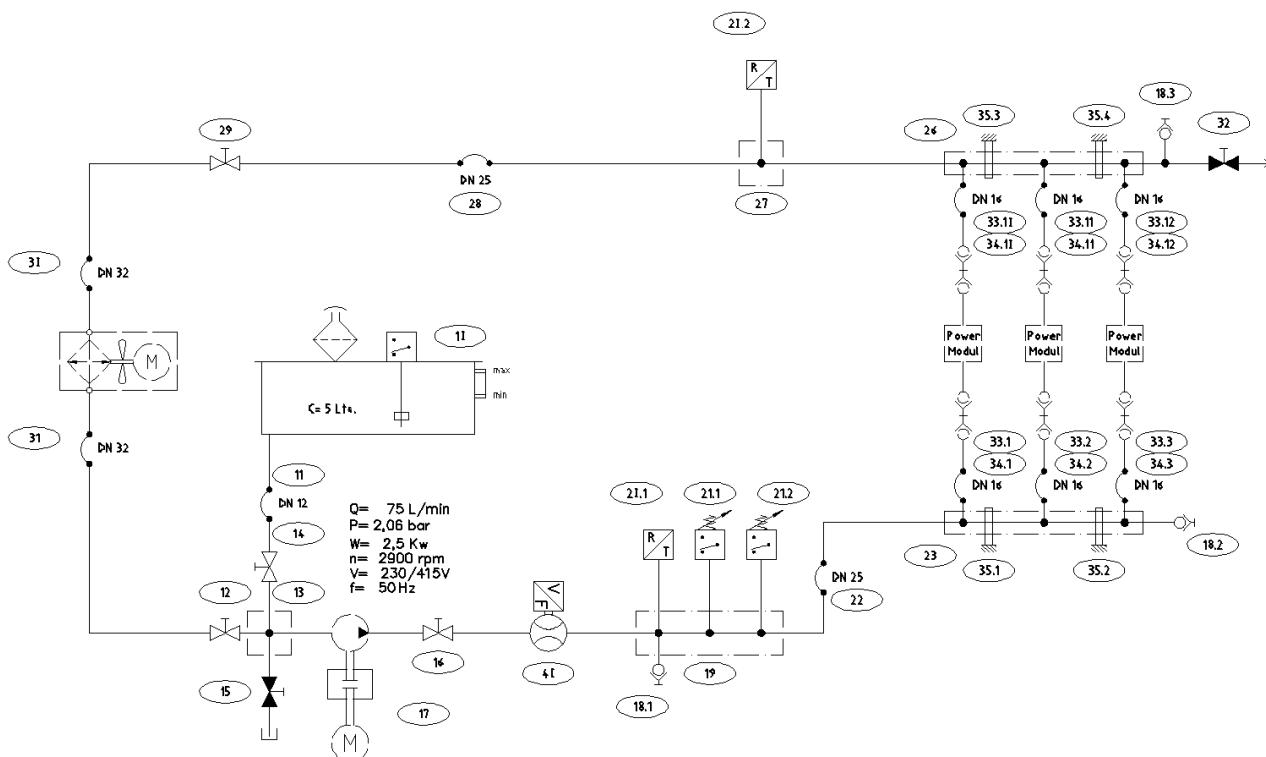
$$\Delta T_{\text{water}} = 5,34 [^{\circ}\text{C}]$$

$$\mathbf{T_{\text{water OUT}} = 54,37 [^{\circ}\text{C}]}$$

Cooler calculation is not our responsibility but the data given can be used in comparison with the existing cooler.

6 PRESSURE DROP CALCULATIONS

6.1 Flow diagram



6.2 Configuration – Pressure drop calculations

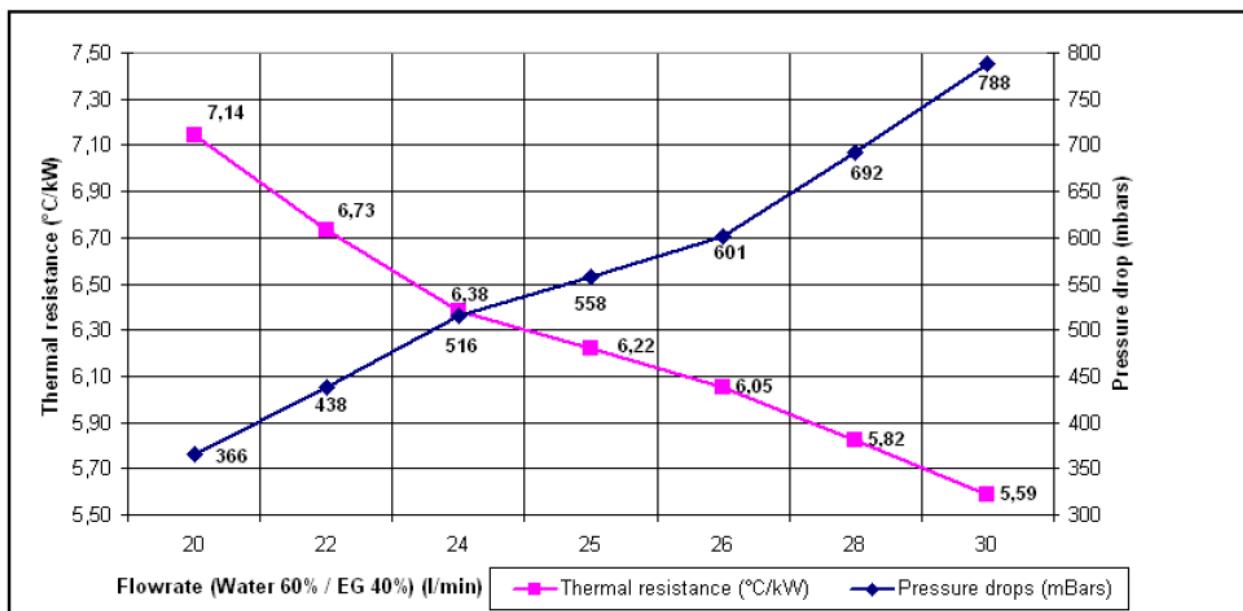
The flow of water glycol in all the circuit is 75 l/min, except in the 3 power modules, which are in parallel connection and share equally the flow ($75/3 = 25$ l/min). The pressure drop through every power module is equal.

The total pressure drop of the circuit will be calculated by the sum of:

1. the pressure drop through power modules ("cold plates") + quick couplings + fittings and hoses (DN16) at 25 l/min flow.
2. the pressure drop through the cooler + main lines at 75 l/min flow.

Pressure drop at 25l/min

Data supplied by CAF P&A:



NOTE: the pressure drop includes the pressure drop related to the connectors (quick couplings) mounted on the coldplate.

For 25 l/min, pressure drop of the cold plates (including 2 x quick coupling connectors SPT12) is **0,558 bar**.

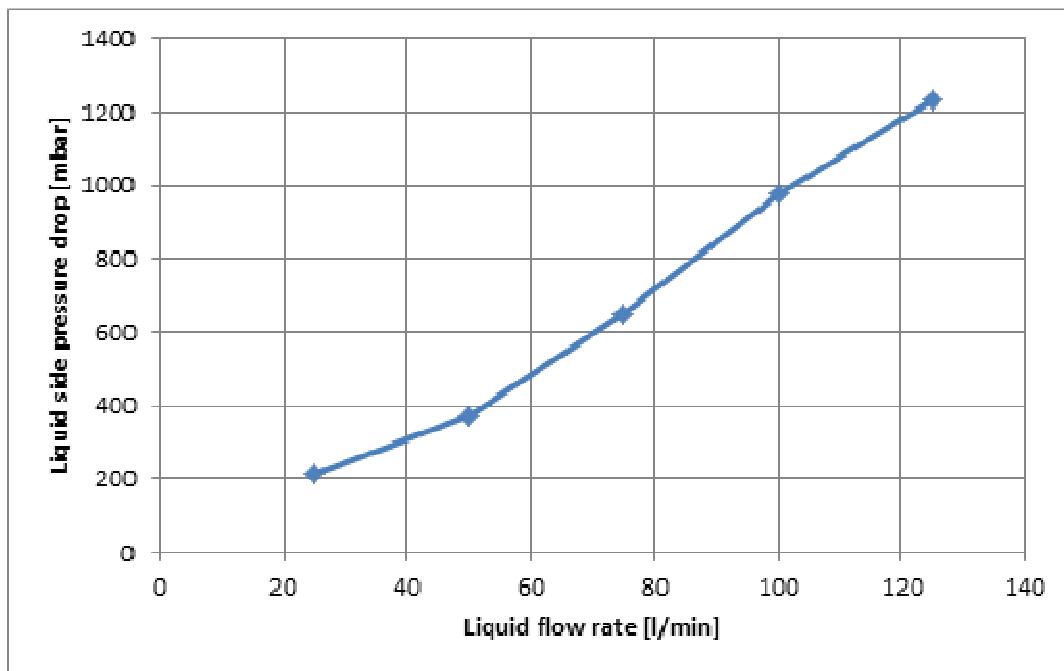
The pressure drop through the fittings (2xGE18LR, $D_{int}=15$) and the hoses (internal diameter of 16 mm) can be obtained from the 3D design of the cooling system, measuring length of hoses, length of rigid tubes and fitting configuration.

From the design we get 2 meters of 16mm hose + 2 meters of 16mm rigid tube + 4 elbows. Fluid conditions at 63°C are 2 cSt or less. Calculated pressure drop for such conditions are **0,27 bar**.

Total pressure drop in 25 l/min branch is = **0,828 bar**

Pressure drop at 75 l/min

Pressure drop of the cooler → given data:



NOTE: Pressure losses curve including connector in/out Staubli RME 20.1155/JS3 + RME 20.7155/JS3

For actual flow of 75 l/min, pressure drop is **0,625 bar**.

For the pressure drop of the fittings and hoses for the rest of the circuit, calculations will be based also on the 3D design. Piping/hoses internal to the motorpump-structure will be 1" (internal diameter of 25mm) and hoses external to this structure are preferred to be 1 ¼" (internal diameter of 32mm), due to larger hose length. Note that the end connection to the cooling tower needs to be reduced to 1" using quick couplings, due to the connection ports.

As before, we get 4 meters of 1" hose internal to the motorpump-structure, with 4 x 90° elbow fittings, for a 2 cSt fluid and 75 l/min, the pressure drop is: **0,29 bar**.

Hoses external to this motorpump-structure are going to be 8 meters of 1 ¼" hoses with 4 x 90° elbows: **0,32 bar**

Total pressure drop in 75 l/min branch is = **1,235 bar**

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Total Pressure drop:

Total pressure drop will be the sum of both branches: 0,828 bar + 1,235 = 2,063 bar.

At 63 °C fluid viscosity is close to 1 cSt, so calculated pressure drops in pipes and hoses are rather conservative. However, as other local pressure drops have not been calculated and as safety margin a **2.5 bar** pressure drop is a good estimation.



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7 PUMP SELECTION

Pump flow = 75 l/min (4,5 m³/h)

Pressure = 2,2 bar

We will oversize the pump slightly to account for 4,5 m³/h and 2,5 bar.

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8 EXPANSION TANK CALCULATION

The expansion tank will account for liquid level variations due to liquid temperature variations. At the same time, it will act as liquid reservoir store a fluid quantity enough to avoid frequent refilling.

Temperature variation in the fluid can be as big as follows:

Minimum ambient temperature = -25 °C

Maximum ambient or fluid temperature = 55 °C

$\Delta T = 80 \text{ } ^\circ\text{C}$

Fluid volume in the circuit is largely dependent on the amount of fluid the cooler can hold inside (unknown data) + fluid in the pipes and hoses. The total amount of fluid in the circuit is estimated to be 35 litres.

The thermal expansion coefficient for the fluid is $\beta = 0,0007 \text{ [K}^{-1}\text{]}$.

So the volume variation can be calculated as $= 0,0007 \text{ [K}^{-1}\text{]} * 35 \text{ [Ltr]} * 80 \text{ [}^\circ\text{C]} = 1,96 \text{ litres}$

The capacity of the expansion tank is decided to be between 5 and 10 litres, depending on space available in detailed design (confirmed capacity of 6 litres at design stage).

Olaberria, 23th February 2016



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DOCUMENTO DI DISEGNO SISTEMA DI RAFFREDAMENTO

LOCOMOTIVA E401

CODICE: B.20.93.211.00

EDIZIONE: A

Pag. 1 di 2

CONTROLLO EDIZIONE

EDIZIONE	MOTIVO	DATA
-	Prima edizione	11-03-2016
A	Cambio formato	20-06-2016

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Data: 20-06-2016

Approvato da:

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Data: 20-06-2016

Verificato da:

Nome: Arnaud Faget
Firma:
Data: 20-06-2016



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DOCUMENTO DI DISEGNO SISTEMA DI RAFFREDAMENTO

LOCOMOTIVA E401

CODICE: B.20.93.211.00

EDIZIONE: A

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I DOCUMENTI DI DESIGN DEL SISTEMA DI REFRIGERAZIONE SONO INDICATI
NEGLI ALLEGATI AGGIUNTI

ALLEGATO 1: Design Document Trenitalia Cooling System

Codice: AX.02.P4.0189

Revisione: 1

Data: 11/03/2016

ALLEGATO 2: BOMs sistema di raffredamento

Codice: AX.02.V0.C007

Revisione: 0

Data: 11/03/2016

ALLEGATO 3: Datasheet sistema di raffredamento

Codice: AX.02.P4.0188

Revisione: 0

Data: 11/03/2016



DISTINTA MATERIALI

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ORDINE	CLIENTE	ATTREZZATURA	QTÀ	D. CONSEGNA	SCHEMA IDRAUL.	SCHEMA MONT.
	CAF P&A	SIST. RAFFR. TRENITALIA: INT. ARMADIO + SERBATOI	2			7-9621.B

AGGIORNAMENTO

DISTINTA MATERIALI
AX.02.70.9002.01

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
10	2	DEP 31681A	SERBATOIO C=6 L SCHEMA 3-1681.A INOX.	HINE DRAWINGS\3-1681.A.pdf	HINE
	2	JUNTA 68775	GUARNIZIONE COPERCHIO SERBATOIO DI NITRILE SCHEMA 6-8775	HINE DRAWINGS\6-8775.pdf	HINE
	2	350533	SONDA LIVELLO ACQUA BEDIA TIPO CLS-20 CONFORME A DIN EN 50155	DATA SHEETS\BEDIA_350533US.pdf	BEDIA
	2	SFW.70-3/4+F-350MB	TAPPO VENTILAZIONE SFW.70-3/4+F-350MB	DATA SHEETS\ELESA_SFW.pdf	ELESA
	2	GE18LM18X1.5EDOMDC F	RACCORDO GE18LM18EDOMDCF	DATA SHEETS\GE-M-ED.pdf	PARKER
	2	EW18LMEDOMDCF	RACCORDO EW18LMEDOMDCF	DATA SHEETS\EW-M-ED.pdf	PARKER
	2	HCX.127-SST-M10	LIVELLO VISIVO HCX.127-SST-M10	DATA SHEETS\ELESA_HCX-SST.pdf	ELESA
	4	MEC 68817	NIPPLO INOX M18x1,5 SCHEMA 6-8817	HINE DRAWINGS\6-8817.pdf	HINE
	4	MAM 27020	MANICOTTO FEMMINA FIG. 270 3/4" INOX	DATA SHEETS\10019.C.pdf	HINE
	2	249035	CONNETTORE NERO DIN 43650-A CON CAVO PVC NERO 5MTS: 249035	DATA SHEETS\MURRELEKTRONIK_249035.pdf	MURRELEKTRONIK
11	1	441RH-8	tubo flessibile 441RH-8	DATA SHEETS\441RH.pdf	PARKER
	2	1CA46-18-8	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-8	DATA SHEETS\1CA46.pdf	PARKER
	1	441RH-8	tubo flessibile 441RH-8	DATA SHEETS\441RH.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
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18	4	PI 586000	PRESA MINIMESS 1/4" 2103-01-18.00	DATA SHEETS\Hydrotechnik_Minimess1620_DS_e.pdf	HYDROTECHNIK
22	0,95	441RH-16	tubo flessibile 441RH-16	DATA SHEETS\441RH.pdf	PARKER
	1	1CF46-28-16	CF. GOMITO 90° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CF46-28-16	DATA SHEETS\1CF46.pdf	PARKER
	1	1CE46-28-16	CE. GOMITO 45° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CE46-28-16	DATA SHEETS\1CE46.pdf	PARKER
	0,52	441RH-16	tubo flessibile 441RH-16	DATA SHEETS\441RH.pdf	PARKER
	1	1CA46-28-16	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-28-16	DATA SHEETS\1CA46.pdf	PARKER
	1	1CE46-28-16	CE. GOMITO 45° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CE46-28-16	DATA SHEETS\1CE46.pdf	PARKER
23	2	MEC 68774C	COLLETTORE USCITE SCHEMA 6-8774.C	HINE DRAWINGS\6-8774.C.pdf	HINE
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	6	GE18LREDOMDCF	CORPO RACCORDO GE18LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	VSTI11/2EDCF	RACCORDO VSTI11/2EDCF	DATA SHEETS\VSTI-ED.pdf	PARKER
	2	CAL 53955	SUPPORTO STRINGITUBI SCHEMA 5-3955	HINE DRAWINGS\5-3955.pdf	HINE
26	2	MEC 68773B	COLLETTORE USCITE SCHEMA 6-8773.B	HINE DRAWINGS\6-8773.B.pdf	HINE
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	6	GE18LREDOMDCF	CORPO RACCORDO GE18LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	VSTI11/2EDCF	RACCORDO VSTI11/2EDCF	DATA SHEETS\VSTI-ED.pdf	PARKER
	2	CAL 53954	SUPPORTO STRINGITUBI SCHEMA 5-3954	HINE DRAWINGS\5-3954.pdf	HINE
	2	VSTI1/4EDCF	TAPPO VSTI1/4EDCF	DATA SHEETS\VSTI-ED.pdf	PARKER
28	0,63	441RH-16	tubo flessibile 441RH-16	DATA SHEETS\441RH.pdf	PARKER
	1	1CA46-28-16	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-28-16	DATA SHEETS\1CA46.pdf	PARKER
	1	1CE46-28-16	CE. GOMITO 45° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CE46-28-16	DATA SHEETS\1CE46.pdf	PARKER
	0,73	441RH-16	tubo flessibile 441RH-16	DATA SHEETS\441RH.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
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32	2	BVG4-1/4L	RUBINETTO BVG4-1/4" LUNGO COD.130480	DATA SHEETS\BVGL.pdf	PARKER
	2	GE10LREDOMDCF	CORPO RACCORDO GE10LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	EGE10LREDCF	RACCORDO EGE10LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	VSTI1/4EDCF	TAPPO VSTI1/4EDCF	DATA SHEETS\VSTI-ED.pdf	PARKER
33	6	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	12	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	6	G18LCFX	RACCORDO G18LCFX	DATA SHEETSG.pdf	PARKER
34	1,5	441RH-10	tubo flessibile 441RH-10 (2 TUBI FLESS. 0,750 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER
	2	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
	2	1CF46-18-10	CF. GOMITO 90° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CF46-18-10	DATA SHEETS\1CF46.pdf	PARKER
	0,71	441RH-10	tubo flessibile 441RH-10 (2 TUBI FLESS. 355 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	4	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
	1,96	441RH-10	tubo flessibile 441RH-10 (2 TUBI FLESS. 980 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER
	2	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
	2	1CF46-18-10	CF. GOMITO 90° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CF46- 18-10	DATA SHEETS\1CF46.pdf	PARKER
	6	GE18LR3/4EDOMDCF	CORPO RACCORDO GE18LR3/4EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
35	3	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	6	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	3	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	6	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	6	G18LCFX	RACCORDO G18LCFX	DATA SHEETS\G.pdf	PARKER
36	1,5	441RH-10	tubo flessibile 441RH-10 (2 TUBI FLESS. 0,750 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	2	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
	2	1CF46-18-10	CF. GOMITO 90° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CF46-18-10	DATA SHEETS\1CF46.pdf	PARKER
0,71	441RH-10		tubo flessibile 441RH-10 (2 TUBI FLESS. 355 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER
	4	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
1,96	441RH-10		tubo flessibile 441RH-10 (2 TUBI FLESS. 980 mm CIASCUNO)	DATA SHEETS\441RH.pdf	PARKER
	2	1CA46-18-10	CA. FEMMINA GIREVOLE METRICA, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CA46-18-10	DATA SHEETS\1CA46.pdf	PARKER
	2	1CF46-18-10	CF. GOMITO 90° METRICO, SERIE LEGGERA, CON GUARNIZ. CIRC. 1CF46-18-10	DATA SHEETS\1CF46.pdf	PARKER
	6	GE18LR3/4EDOMDCF	CORPO RACCORDO GE18LR3/4EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
100	2	VSTI3/4EDCF	RACCORDO VSTI3/4EDCF	DATA SHEETS\VSTI-ED.pdf	PARKER

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AX.02.70.9002.02

ORDINE	CLIENTE	ATTREZZATURA	QTÀ	D. CONSEGNA	SCHEMA IDRAUL.	SCHEMA MONT.
	CAF P&A	SIST. RAFFR. TRENITALIA: SUPPORTO ZONA 1	1			7-9514.C

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AX.02.70.9002.02

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
11	2	SV18LOMDCF	RACCORDO SV18LOMDCF	DATA SHEETS\SV.pdf	PARKER
	2	EV18LOMDCF	RACCORDO EV18LOMDCF	DATA SHEETS\EV.pdf	PARKER
	1	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	2	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	1	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	2	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	2	RAPR12218	STAFFA RAPR12-218	DATA SHEETS\RAPR12-218.pdf	FKB
12	2	BVG4-1.1/4L	VALVOLA A SFERA 1.1/4	DATA SHEETS\BVGL.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
13	2	MEC 68725A	COLLETTORE USCITE SCHEMA 6-8725.A	HINE DRAWINGS\6-8725.A.pdf	HINE
	2	EGE35LREDF	RACCORDO EGE35LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	WEE35LROMDCF	RACCORDO WEE35LROMDCF	DATA SHEETS\WEE-R.pdf	PARKER
	2	EW28LREDOMDCF	RACCORDO EW28LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
	2	EGE28LREDF	RACCORDO EGE28LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	EW18LREDOMDCF	RACCORDO EW18LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
	2	EGE18LREDF	RACCORDO EGE18LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	OR 2228SH90	GUARNIZIONE CIRC. 56,74 X 3,53 90 SHORE	DATA SHEETS\OR 2228SH90.pdf	ACCESORIOS

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DISTINTA MATERIALI
AX.02.70.9002.02

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
14	2	BVG4-1/2L	VALVOLA A SFERA BVG4-1/2L	DATA SHEETS\BVGL.pdf	PARKER
	2	EW18LREDOMDCF	RACCORDO EW18LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
15	2	BVG4-1L	VALVOLA A SFERA BVG4-1L	DATA SHEETS\BVGL.pdf	PARKER
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	3C382-28-16-K	RACCORDO 3C382-28-16-K	DATA SHEETS\3C382-28-16-K.pdf	PARKER
16	2	BVG4-1L	VALVOLA A SFERA BVG4-1L	DATA SHEETS\BVGL.pdf	PARKER
	2	MEC 68726.A	COLLETTORE SCHEMA 6-8726.A	HINE DRAWINGS\6-8726.A.pdf	HINE
	2	OR 2226SH90	GUARNIZIONE CIRC. 50,39 X 3,53 90 SHORE	DATA SHEETS\OR 2226SH90.pdf	ACCESORIOS
	4	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	EGE28LREDCF	RACCORDO EGE28LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER
17	1	CAL 53942B	SUPPORTO 2 MOTOPOMPE SCHEMA 5-3942.B	HINE DRAWINGS\5-3942.B.pdf	HINE
	2	CAN H05T	GOLFARE MODELLO H 05,T (22-01-002)	DATA SHEETS\COLIN MILAS_CAN H05T.pdf	ACCESORIOS
	0,2	TS11AB114571	GUIDA TS-11-A-B1-14571 (2 m. INOX)	DATA SHEETS\TS-11-A-B1.pdf	FKB
18	2	PI 586000	PRESA MINIMESS 1/4" 2103-01-18.00	DATA SHEETS\Hydrotechnik_Minimess1620_DS_e.pdf	HYDROTECHNIK
19	2	MEC 68771A	COLLETTORE USCITE SCHEMA 6-8771.A	HINE DRAWINGS\6-8771.A.pdf	HINE
	2	EGE28LREDCF	RACCORDO EGE28LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER

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AX.02.70.9002.02

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	1	EV28LOMDCF	RACCORDO EV28LOMDCF	DATA SHEETS\EV.pdf	PARKER
20	4	PT100902815	SONDA PT100 902815/10-380-1003-1-6-50-102-26-950	DATA SHEETS\JUMO_t90.2815en.pdf	JUMO
	4	AM 496303	RONDELLA METALLOPLASTICA 1/4" SCN-9021	DATA SHEETS\LEGRIS_01391300.pdf	ACCESORIOS
	4	7000122416350500	CAVO 5 POLI M12 DRITTO FEMMINA A LIBERO 7000-12241-6350500	DATA SHEETS\7000-12241-6350500.pdf	MURRELEKTRONIK
21	4	832075231778T1111M4 4	PRESSOSTATO (TRAFAg) 8320.75.2317.78.T1.11.1M.44	DATA SHEETS\TRAFAg_H72333e_EN_8320_EPN-S_Electronic_Pressure_Switch.pdf	TRAFAg
	4	7000294050000000	CONNETTORE 7000-29405-0000000 MSVSE-EB5K-M16	DATA SHEETS\7000-29405-0000000.pdf	MURRELEKTRONIK
	4	AM 496303	RONDELLA METALLOPLASTICA 1/4" SCN-9021	DATA SHEETS\LEGRIS_01391300.pdf	ACCESORIOS
22	1	T 316L282	TUBO INOX 316L 28 X 2	DATA SHEETS\THT-3R60-28-2.pdf	ACCESORIOS
	2	FM28LCF	DADO FM28LCF	DATA SHEETS\FM.pdf	PARKER
	1	SV28LOMDCF	CORPO RACCORDO SV28LOMDCF	DATA SHEETS\SV.pdf	PARKER
	1	RAPR12428	STAFFA RAPR12-428	DATA SHEETS\RAPR12-428.pdf	FKB
27	1	MEC 68772	COLLETTORE USCITE SCHEMA 6-8772	HINE DRAWINGS\6-8772.pdf	HINE

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AX.02.70.9002.02

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	1	EW28LOMDCF	CORPO RACCORDO EW28LOMDCF	DATA SHEETS\EW.pdf	PARKER
	2	GE28LR11/4EDOMDCF	RACCORDO GE28LR11/4EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
28	1	T 316L282	TUBO INOX 316L 28 X 2	DATA SHEETS\THT-3R60-28-2.pdf	ACCESORIOS
	2	FM28LCF	DADO FM28LCF	DATA SHEETS\FM.pdf	PARKER
	1	SV28LOMDCF	CORPO RACCORDO SV28LOMDCF	DATA SHEETS\SV.pdf	PARKER
29	2	BVG4-1.1/4L	VALVOLA A SFERA 1.1/4	DATA SHEETS\BVGL.pdf	PARKER
	2	EGE35LREDCF	RACCORDO EGE35LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
50	1	ROT 78053B	ETICHETTA SCHEMA 7-8053.B	HINE DRAWINGS\7-8053.B.pdf	ACCESORIOS
	1	ROT 78158	ETICHETTA SCHEMA 7-8158	HINE DRAWINGS\7-8158.pdf	ACCESORIOS
101	1	19300100527	CAPOTE INGRESSO LATERALE, RIF. 19300100527	DATA SHEETS\HARTING_19300100527.pdf	HARTING
102	1	BG232MS	PREMISTOPPA BLUEGLOBE M32 FILETTO CORTO PFLITSCH (BG232MS)	DATA SHEETS\BG232MS.pdf	ACCESORIOS
103	1	09140100303	MODULO HAN 10B 3 PASTIGLIE, RIF. 09140100303	DATA SHEETS\HARTING_09140100303.pdf	HARTING
104	2	09140009932	MODULO SUB-D9 MASCHIO, RIF. 09140009932	DATA SHEETS\HARTING_09140009932.pdf	HARTING

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AX.02.70.9002.02

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
105	2	09670095601	INSERTO SUB-D9 MASCHIO, RIF. 09670095601	DATA SHEETS\HARTING_09670095601.pdf	HARTING
106	1	09140173001	MODULO HAN DDD17 MASCHIO, RIF. 09140173001	DATA SHEETS\HARTING_09140173001.pdf	HARTING
107	12	09670003576	PIN SUB D9 MASCHIO, RIF. 09670003576	DATA SHEETS\HARTING_09670003576.pdf	HARTING
108	16	09150006305	PIN HAN D 0.75MM2 MASCHIO, RIF. 09150006305	DATA SHEETS\HARTING_09150006305.pdf	HARTING

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AX.02.70.9002.03

ORDINE	CLIENTE	ATTREZZATURA	QTÀ	D. CONSEGNA	SCHEMA IDRAUL.	SCHEMA MONT.
	CAF P&A	SIST. RAFFR. TRENITALIA: SUPPORTO ZONA 2	1			7-9515.C

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AX.02.70.9002.03

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
11	2	SV18LOMDCF	RACCORDO SV18LOMDCF	DATA SHEETS\SV.pdf	PARKER
	2	EV18LOMDCF	RACCORDO EV18LOMDCF	DATA SHEETS\EV.pdf	PARKER
	1	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	2	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	1	T 316L1815	TUBO INOX 316L 18 X 1,5	DATA SHEETS\THT-3R60-18-1.5.pdf	ACCESORIOS
	2	FM18LCF	DADO FM18LCF	DATA SHEETS\FM.pdf	PARKER
	2	RAPR12218	STAFFA RAPR12-218	DATA SHEETS\RAPR12-218.pdf	FKB
12	2	BVG4-1.1/4L	VALVOLA A SFERA 1.1/4	DATA SHEETS\BVGL.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
13	2	MEC 68725A	COLLETTORE USCITE SCHEMA 6-8725.A	HINE DRAWINGS\6-8725.A.pdf	HINE
	2	EGE35LREDF	RACCORDO EGE35LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	WEE35LROMDCF	RACCORDO WEE35LROMDCF	DATA SHEETS\WEE-R.pdf	PARKER
	2	EW28LREDOMDCF	RACCORDO EW28LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
	2	EGE28LREDF	RACCORDO EGE28LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	EW18LREDOMDCF	RACCORDO EW18LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
	2	EGE18LREDF	RACCORDO EGE18LREDF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	OR 2228SH90	GUARNIZIONE CIRC. 56,74 X 3,53 90 SHORE	DATA SHEETS\OR 2228SH90.pdf	ACCESORIOS

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AX.02.70.9002.03

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
14	2	BVG4-1/2L	VALVOLA A SFERA BVG4-1/2L	DATA SHEETS\BVGL.pdf	PARKER
	2	EW18LREDOMDCF	RACCORDO EW18LREDOMDCF	DATA SHEETS\EW-R-ED.pdf	PARKER
15	2	BVG4-1L	VALVOLA A SFERA BVG4-1L	DATA SHEETS\BVGL.pdf	PARKER
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	3C382-28-16-K	RACCORDO 3C382-28-16-K	DATA SHEETS\3C382-28-16-K.pdf	PARKER
16	2	BVG4-1L	VALVOLA A SFERA BVG4-1L	DATA SHEETS\BVGL.pdf	PARKER
	2	MEC 68726.A	COLLETTORE SCHEMA 6-8726.A	HINE DRAWINGS\6-8726.A.pdf	HINE
	2	OR 2226SH90	GUARNIZIONE CIRC. 50,39 X 3,53 90 SHORE	DATA SHEETS\OR 2226SH90.pdf	ACCESORIOS
	4	GE28LREDOMDCF	CORPO RACCORDO GE28LRDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	EGE28LREDCF	RACCORDO EGE28LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER
17	1	CAL 53942B	SUPPORTO 2 MOTOPOMPE SCHEMA 5-3942.B	HINE DRAWINGS\5-3942.B.pdf	HINE
	2	CAN H05T	GOLFARE MODELLO H 05,T (22-01-002)	DATA SHEETS\COLIN MILAS_CAN H05T.pdf	ACCESORIOS
	0,2	TS11AB114571	GUIDA TS-11-A-B1-14571 (2 m. INOX)	DATA SHEETS\TS-11-A-B1.pdf	FKB
18	2	PI 586000	PRESA MINIMESS 1/4" 2103-01-18.00	DATA SHEETS\Hydrotechnik_Minimess1620_DS_e.pdf	HYDROTECHNIK
19	2	MEC 68771A	COLLETTORE USCITE SCHEMA 6-8771.A	HINE DRAWINGS\6-8771.A.pdf	HINE
	2	EGE28LREDCF	RACCORDO EGE28LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER

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ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	2	GE28LREDOMDCF	CORPO RACCORDO GE28LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	1	EV28LOMDCF	RACCORDO EV28LOMDCF	DATA SHEETS\EV.pdf	PARKER
20	4	PT100902815	SONDA PT100 902815/10-380-1003-1-6-50-102-26-950	DATA SHEETS\JUMO_t90.2815en.pdf	JUMO
	4	AM 496303	RONDELLA METALLOPLASTICA 1/4" SCN-9021	DATA SHEETS\LEGRIS_01391300.pdf	ACCESORIOS
	4	7000122416350500	CAVO 5 POLI M12 DRITTO FEMMINA A LIBERO 7000-12241-6350500	DATA SHEETS\7000-12241-6350500.pdf	MURRELEKTRONIK
21	4	832075231778T1111M4 4	PRESSOSTATO (TRAFAg) 8320.75.2317.78.T1.11.1M.44	DATA SHEETS\TRAFAg_H72333e_EN_8320_EPN-S_Electronic_Pressure_Switch.pdf	TRAFAg
	4	7000294050000000	CONNETTORE 7000-29405-0000000 MSVSE-EB5K-M16	DATA SHEETS\7000-29405-0000000.pdf	MURRELEKTRONIK
	4	AM 496303	RONDELLA METALLOPLASTICA 1/4" SCN-9021	DATA SHEETS\LEGRIS_01391300.pdf	ACCESORIOS
22	1	T 316L282	TUBO INOX 316L 28 X 2	DATA SHEETS\THT-3R60-28-2.pdf	ACCESORIOS
	2	FM28LCF	DADO FM28LCF	DATA SHEETS\FM.pdf	PARKER
	1	SV28LOMDCF	CORPO RACCORDO SV28LOMDCF	DATA SHEETS\SV.pdf	PARKER
	1	RAPR12428	STAFFA RAPR12-428	DATA SHEETS\RAPR12-428.pdf	FKB
27	1	MEC 68772	COLLETTORE USCITE SCHEMA 6-8772	HINE DRAWINGS\6-8772.pdf	HINE

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AX.02.70.9002.03

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
	1	EW28LOMDCF	CORPO RACCORDO EW28LOMDCF	DATA SHEETS\EW.pdf	PARKER
	2	GE28LR11/4EDOMDCF	RACCORDO GE28LR11/4EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
28	1	T 316L282	TUBO INOX 316L 28 X 2	DATA SHEETS\THT-3R60-28-2.pdf	ACCESORIOS
	2	FM28LCF	DADO FM28LCF	DATA SHEETS\FM.pdf	PARKER
	1	SV28LOMDCF	CORPO RACCORDO SV28LOMDCF	DATA SHEETS\SV.pdf	PARKER
29	2	BVG4-1.1/4L	VALVOLA A SFERA 1.1/4	DATA SHEETS\BVGL.pdf	PARKER
	2	EGE35LREDCF	RACCORDO EGE35LREDCF	DATA SHEETS\EGE-R-ED.pdf	PARKER
	2	GE35LREDOMDCF	CORPO RACCORDO GE35LREDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
50	1	ROT 78053B	ETICHETTA SCHEMA 7-8053.B	HINE DRAWINGS\7-8053.B.pdf	ACCESORIOS
	1	ROT 78159	ETICHETTA SCHEMA 7-8159	HINE DRAWINGS\7-8158.pdf	ACCESORIOS
101	1	19300100527	CAPOTE INGRESSO LATERALE, RIF. 19300100527	DATA SHEETS\HARTING_19300100527.pdf	HARTING
102	1	BG232MS	PREMISTOPPA BLUEGLOBE M32 FILETTO CORTO PFLITSCH (BG232MS)	DATA SHEETS\BG232MS.pdf	ACCESORIOS
103	1	09140100303	MODULO HAN 10B 3 PASTIGLIE, RIF. 09140100303	DATA SHEETS\HARTING_09140100303.pdf	HARTING
104	2	09140009932	MODULO SUB-D9 MASCHIO, RIF. 09140009932	DATA SHEETS\HARTING_09140009932.pdf	HARTING

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AX.02.70.9002.03

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
105	2	09670095601	INSERTO SUB-D9 MASCHIO, RIF. 09670095601	DATA SHEETS\HARTING_09670095601.pdf	HARTING
106	1	09140173001	MODULO HAN DDD17 MASCHIO, RIF. 09140173001	DATA SHEETS\HARTING_09140173001.pdf	HARTING
107	12	09670003576	PIN SUB D9 MASCHIO, RIF. 09670003576	DATA SHEETS\HARTING_09670003576.pdf	HARTING
108	16	09150006305	PIN HAN D 0.75MM2 MASCHIO, RIF. 09150006305	DATA SHEETS\HARTING_09150006305.pdf	HARTING

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AX.02.70.9002.04

ORDINE	CLIENTE	ATTREZZATURA	QTÀ	D. CONSEGNA	SCHEMA IDRAUL.	SCHEMA MONT.
	CAF P&A	SIST. RAFFR. TRENITALIA: TUBI FLESSIBILI ZONA 1	1			7-9622.A

AGGIORNAMENTO:

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AX.02.70.9002.04

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
30	2,33	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CA48-28-20	1CA48-28-20	DATA SHEETS\1CA48.pdf	PARKER
	1,15	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CA48-35-20	1CA48-35-20	DATA SHEETS\1CA48.pdf	PARKER
	1	GE35LR1EDOMDCF	CORPO RACCORDO GE35LR1EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
31	0,65	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	2	1CA48-35-20	1CA48-35-20	DATA SHEETS\1CA48.pdf	PARKER
	1	GE35LR1EDOMDCF	CORPO RACCORDO GE35LR1EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	1,52	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CF48-35-20	TERMINALE 1CF48-35-20	DATA SHEETS\1CF48.pdf	PARKER
	1	1CA48-28-20	1CA48-28-20	DATA SHEETS\1CA48.pdf	PARKER

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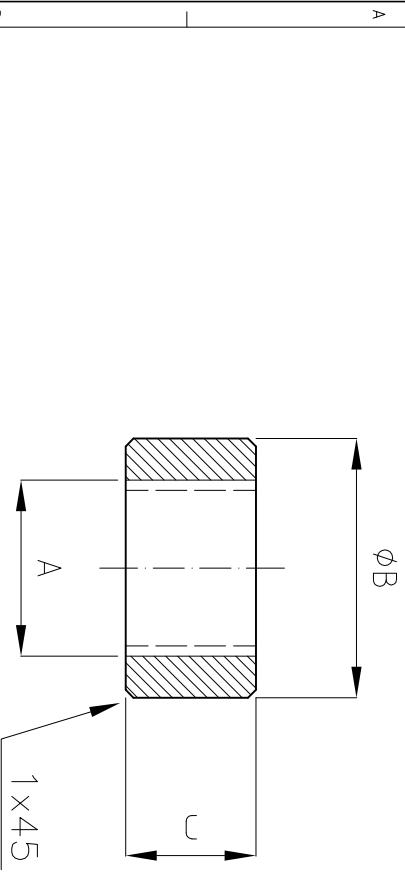
ORDINE	CLIENTE	ATTREZZATURA	QTÀ	D.CONSEGNA	N. SCHEMA	SCHEMA MONT.
	CAF P&A	SIST. RAFFR. TRENITALIA: TUBI FLESSIBILI ZONA 2	1			7-9623.A

AGGIORNAMENTO:

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AX.02.70.9002.05

ART.	QTÀ	CODICE	DENOMINAZIONE	SCHEDA TECNICA	PRODUTTORE
30	2,13	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 45° REF. 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CA48-28-20	1CA48-28-20	DATA SHEETS\1CA48.pdf	PARKER
	1,12	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 45° REF. 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CE48-28-20	TERMINALE 45° REF. 1CE48-28-20	DATA SHEETS\1CE48.pdf	PARKER
31	0,62	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 45° RIF. 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CA48-35-20	1CA48-35-20	DATA SHEETS\1CA48.pdf	PARKER
	1	GE35LR1EDOMDCF	CORPO RACCORDO GE35LR1EDOMDCF	DATA SHEETS\GE-R-ED.pdf	PARKER
	1,88	421RH-20	tubo flessibile 421RH-20	DATA SHEETS\421RH.pdf	PARKER
	1	1CE48-35-20	TERMINALE 45° RIF. 1CE48-35-20	DATA SHEETS\1CE48.pdf	PARKER
	1	1CE48-28-20	TERMINALE 45° RIF. 1CE48-28-20	DATA SHEETS\1CE48.pdf	PARKER

AGGIORNAMENTO:



A	B (ϕ ext.)	C
1/8"	14	18
1/4"	20	22
1/4" L	20	25
3/8"	25	27
1/2"	30	33
3/4"	35	35
1"	42	39
1 1/4"	55	42
1 1/2"	60	46
2"	70	48

NOTA

MATERIAL ACERO: F-111

MATERIAL INOX: AISI 304L, 316L, ETC.
El material se especificará en el pedido.

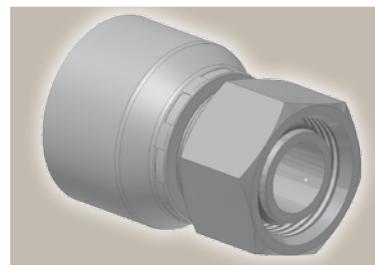
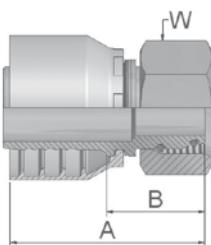
FORMAT	NOTA NOTE	MATERIAL:	TRATAM:	PESO (kg):
FORMAT A3	DIBUJADO DRAWN J.M	FECHA DATE 28.04.08	TITULO: TITLE:	

DE MAMELONES

Nº O.T.:	Nº PLANO:	EDICION:
ORDER N°:	DRWG N°:	REV.:
000000	10019	C
ASIGNACION OLD FILE:	10019.C	HOJA SHEET 1 DE OF 1

CA
**Female Metric 24°
Light Series with O-Ring
Swivel – Straight**

ISO 12151-2-SWS-L – DKOL



Part Number		Hose I.D.				Thread	Tube	A	B	W
46 series	48 series	DN	Inch	Size	mm	metric	O.D.	mm	mm	mm
1CA46-6-4	1CA48-6-4	6	1/4	-4	6.4	M12x1.5	6	46	22	14
1CA46-8-4	1CA48-8-4	6	1/4	-4	6.4	M14x1.5	8	46	22	17
1CA46-10-4	1CA48-10-4	6	1/4	-4	6.4	M16x1.5	10	46	22	19
1CA46-12-4	1CA48-12-4	6	1/4	-4	6.4	M18x1.5	12	46	22	22
1CA46-8-5	1CA48-8-5	8	5/16	-5	7.9	M14x1.5	8	50	26	17
1CA46-10-5	1CA48-10-5	8	5/16	-5	7.9	M16x1.5	10	46	22	19
1CA46-12-5	1CA48-12-5	8	5/16	-5	7.9	M18x1.5	12	46	22	22
1CA46-8-6	1CA48-8-6	10	3/8	-6	9.5	M14x1.5	8	49	26	17
1CA46-10-6	1CA48-10-6	10	3/8	-6	9.5	M16x1.5	10	46	23	19
1CA46-12-6	1CA48-12-6	10	3/8	-6	9.5	M18x1.5	12	46	23	22
1CA46-15-6	1CA48-15-6	10	3/8	-6	9.5	M22x1.5	15	47	24	27
1CA46-18-6	1CA48-18-6	10	3/8	-6	9.5	M26x1.5	18	50	28	32
1CA46-12-8	1CA48-12-8	12	1/2	-8	12.7	M18x1.5	12	50	26	22
1CA46-15-8	1CA48-15-8	12	1/2	-8	12.7	M22x1.5	15	50	26	27
1CA46-18-8	1CA48-18-8	12	1/2	-8	12.7	M26x1.5	18	49	25	32
1CA46-15-10	1CA48-15-10	16	5/8	-10	15.9	M22x1.5	15	54	29	27
1CA46-18-10	1CA48-18-10	16	5/8	-10	15.9	M26x1.5	18	50	25	32
1CA46-22-10	1CA48-22-10	16	5/8	-10	15.9	M30x2	22	58	33	36
1CA46-18-12	1CA48-18-12	19	3/4	-12	19.1	M26x1.5	18	51	25	32
1CA46-22-12	1CA48-22-12	19	3/4	-12	19.1	M30x2	22	56	30	36
1CA46-28-12	1CA48-28-12	19	3/4	-12	19.1	M36x2	28	61	35	41
1CA46-22-16	1CA48-22-16	25	1	-16	25.4	M30x2	22	60	30	36
1CA46-28-16	1CA48-28-16	25	1	-16	25.4	M36x2	28	63	33	41
1CA46-35-16	1CA48-35-16	25	1	-16	25.4	M45x2	35	63	33	50
	1CA48-28-20	31	1 1/4	-20	31.8	M36x2	28	81	34	41
	1CA48-35-20	31	1 1/4	-20	31.8	M45x2	35	82	35	50
1CA46-35-20		31	1 1/4	-20	31.8	M45x2	35	69	31	50
	1CA48-42-20	31	1 1/4	-20	31.8	M52x2	42	82	35	60
	1CA48-35-24	38	1 1/2	-24	38.1	M45x2	35	75	37	50
	1CA48-42-24	38	1 1/2	-24	38.1	M52x2	42	77	39	60

46/48 Series

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.
 Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or **48** | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

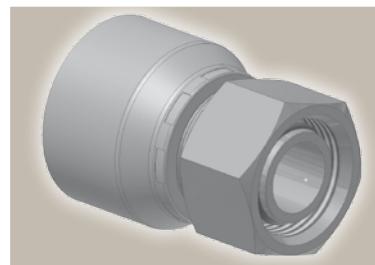
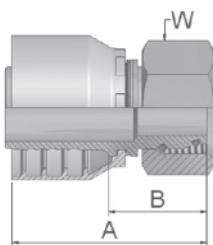
46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

CA
**Female Metric 24°
Light Series with O-Ring
Swivel – Straight**

ISO 12151-2-SWS-L – DKOL



Part Number		Hose I.D.				Thread	Tube	A	B	W
46 series	48 series	DN	Inch	Size	mm	metric	O.D.	mm	mm	mm
1CA46-6-4	1CA48-6-4	6	1/4	-4	6.4	M12x1.5	6	46	22	14
1CA46-8-4	1CA48-8-4	6	1/4	-4	6.4	M14x1.5	8	46	22	17
1CA46-10-4	1CA48-10-4	6	1/4	-4	6.4	M16x1.5	10	46	22	19
1CA46-12-4	1CA48-12-4	6	1/4	-4	6.4	M18x1.5	12	46	22	22
1CA46-8-5	1CA48-8-5	8	5/16	-5	7.9	M14x1.5	8	50	26	17
1CA46-10-5	1CA48-10-5	8	5/16	-5	7.9	M16x1.5	10	46	22	19
1CA46-12-5	1CA48-12-5	8	5/16	-5	7.9	M18x1.5	12	46	22	22
1CA46-8-6	1CA48-8-6	10	3/8	-6	9.5	M14x1.5	8	49	26	17
1CA46-10-6	1CA48-10-6	10	3/8	-6	9.5	M16x1.5	10	46	23	19
1CA46-12-6	1CA48-12-6	10	3/8	-6	9.5	M18x1.5	12	46	23	22
1CA46-15-6	1CA48-15-6	10	3/8	-6	9.5	M22x1.5	15	47	24	27
1CA46-18-6	1CA48-18-6	10	3/8	-6	9.5	M26x1.5	18	50	28	32
1CA46-12-8	1CA48-12-8	12	1/2	-8	12.7	M18x1.5	12	50	26	22
1CA46-15-8	1CA48-15-8	12	1/2	-8	12.7	M22x1.5	15	50	26	27
1CA46-18-8	1CA48-18-8	12	1/2	-8	12.7	M26x1.5	18	49	25	32
1CA46-15-10	1CA48-15-10	16	5/8	-10	15.9	M22x1.5	15	54	29	27
1CA46-18-10	1CA48-18-10	16	5/8	-10	15.9	M26x1.5	18	50	25	32
1CA46-22-10	1CA48-22-10	16	5/8	-10	15.9	M30x2	22	58	33	36
1CA46-18-12	1CA48-18-12	19	3/4	-12	19.1	M26x1.5	18	51	25	32
1CA46-22-12	1CA48-22-12	19	3/4	-12	19.1	M30x2	22	56	30	36
1CA46-28-12	1CA48-28-12	19	3/4	-12	19.1	M36x2	28	61	35	41
1CA46-22-16	1CA48-22-16	25	1	-16	25.4	M30x2	22	60	30	36
1CA46-28-16	1CA48-28-16	25	1	-16	25.4	M36x2	28	63	33	41
1CA46-35-16	1CA48-35-16	25	1	-16	25.4	M45x2	35	63	33	50
	1CA48-28-20	31	1 1/4	-20	31.8	M36x2	28	81	34	41
	1CA48-35-20	31	1 1/4	-20	31.8	M45x2	35	82	35	50
1CA46-35-20		31	1 1/4	-20	31.8	M45x2	35	69	31	50
	1CA48-42-20	31	1 1/4	-20	31.8	M52x2	42	82	35	60
	1CA48-35-24	38	1 1/2	-24	38.1	M45x2	35	75	37	50
	1CA48-42-24	38	1 1/2	-24	38.1	M52x2	42	77	39	60

46/48 Series

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.
 Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or **48** | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

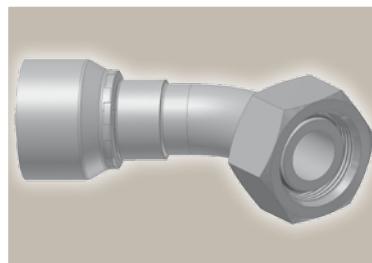
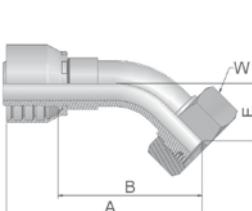
48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

CE

**Female Metric 24°
Light Series with O-Ring
Swivel – 45° Elbow**

ISO 12151-2-SWE 45°-L – DKOL 45°



Part Number		Hose I.D.				Thread metric	Tube	A mm	B mm	E mm	W mm
46 series	48 series	DN	Inch	Size	mm						
1CE46-6-4	1CE48-6-4	6	1/4	-4	6.4	M12x1.5	6	70	45	19	14
1CE46-8-4	1CE48-8-4	6	1/4	-4	6.4	M14x1.5	8	59	35	16	17
1CE46-10-4	1CE48-10-4	6	1/4	-4	6.4	M16x1.5	10	59	35	16	19
1CE46-12-4	1CE48-12-4	6	1/4	-4	6.4	M18x1.5	12	59	36	16	22
1CE46-8-5	1CE48-8-5	8	5/16	-5	7.9	M14x1.5	8	64	40	19	17
1CE46-10-5	1CE48-10-5	8	5/16	-5	7.9	M16x1.5	10	67	43	15	19
1CE46-12-5	1CE48-12-5	8	5/16	-5	7.9	M18x1.5	12	61	37	16	22
1CE46-10-6	1CE48-10-6	10	3/8	-6	9.5	M16x1.5	10	68	45	20	19
1CE46-12-6	1CE48-12-6	10	3/8	-6	9.5	M18x1.5	12	68	45	19	22
1CE46-15-6	1CE48-15-6	10	3/8	-6	9.5	M22x1.5	15	68	45	19	27
1CE46-12-8	1CE48-12-8	12	1/2	-8	12.7	M18x1.5	12	74	51	23	22
1CE46-15-8	1CE48-15-8	12	1/2	-8	12.7	M22x1.5	15	71	47	22	27
1CE46-18-8	1CE48-18-8	12	1/2	-8	12.7	M26x1.5	18	71	47	22	32
1CE46-15-10	1CE48-15-10	16	5/8	-10	15.9	M22x1.5	15	79	54	26	27
1CE46-18-10	1CE48-18-10	16	5/8	-10	15.9	M26x1.5	18	75	50	23	32
1CE46-18-12	1CE48-18-12	19	3/4	-12	19.1	M26x1.5	18	90	64	27	32
1CE46-22-12	1CE48-22-12	19	3/4	-12	19.1	M30x2	22	88	62	26	36
1CE46-28-12	1CE48-28-12	19	3/4	-12	19.1	M36x2	28	90	64	28	41
1CE46-22-16	1CE48-22-16	25	1	-16	25.4	M30x2	22	112	82	35	36
1CE46-28-16		25	1	-16	25.4	M36x2	28	113	83	33	41
	1CE48-28-16	25	1	-16	25.4	M36x2	28	113	83	33	41
	1CE48-28-20	31	1 1/4	-20	31.8	M36x2	28	142	95	40	41
	1CE48-35-20	31	1 1/4	-20	31.8	M45x2	35	141	94	37	50
1CE46-35-20		31	1 1/4	-20	31.8	M45x2	35	130	92	32	50
	1CE48-42-24	38	1 1/2	-24	38.1	M52x2	42	155	117	49	60

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.

Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or **48** | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

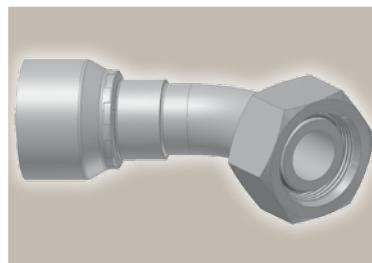
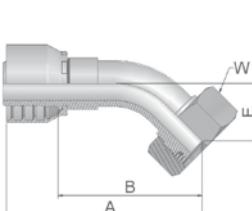
48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

CE

**Female Metric 24°
Light Series with O-Ring
Swivel – 45° Elbow**

ISO 12151-2-SWE 45°-L – DKOL 45°



Part Number		Hose I.D.				Thread metric	Tube	A mm	B mm	E mm	W mm
46 series	48 series	DN	Inch	Size	mm						
1CE46-6-4	1CE48-6-4	6	1/4	-4	6.4	M12x1.5	6	70	45	19	14
1CE46-8-4	1CE48-8-4	6	1/4	-4	6.4	M14x1.5	8	59	35	16	17
1CE46-10-4	1CE48-10-4	6	1/4	-4	6.4	M16x1.5	10	59	35	16	19
1CE46-12-4	1CE48-12-4	6	1/4	-4	6.4	M18x1.5	12	59	36	16	22
1CE46-8-5	1CE48-8-5	8	5/16	-5	7.9	M14x1.5	8	64	40	19	17
1CE46-10-5	1CE48-10-5	8	5/16	-5	7.9	M16x1.5	10	67	43	15	19
1CE46-12-5	1CE48-12-5	8	5/16	-5	7.9	M18x1.5	12	61	37	16	22
1CE46-10-6	1CE48-10-6	10	3/8	-6	9.5	M16x1.5	10	68	45	20	19
1CE46-12-6	1CE48-12-6	10	3/8	-6	9.5	M18x1.5	12	68	45	19	22
1CE46-15-6	1CE48-15-6	10	3/8	-6	9.5	M22x1.5	15	68	45	19	27
1CE46-12-8	1CE48-12-8	12	1/2	-8	12.7	M18x1.5	12	74	51	23	22
1CE46-15-8	1CE48-15-8	12	1/2	-8	12.7	M22x1.5	15	71	47	22	27
1CE46-18-8	1CE48-18-8	12	1/2	-8	12.7	M26x1.5	18	71	47	22	32
1CE46-15-10	1CE48-15-10	16	5/8	-10	15.9	M22x1.5	15	79	54	26	27
1CE46-18-10	1CE48-18-10	16	5/8	-10	15.9	M26x1.5	18	75	50	23	32
1CE46-18-12	1CE48-18-12	19	3/4	-12	19.1	M26x1.5	18	90	64	27	32
1CE46-22-12	1CE48-22-12	19	3/4	-12	19.1	M30x2	22	88	62	26	36
1CE46-28-12	1CE48-28-12	19	3/4	-12	19.1	M36x2	28	90	64	28	41
1CE46-22-16	1CE48-22-16	25	1	-16	25.4	M30x2	22	112	82	35	36
1CE46-28-16		25	1	-16	25.4	M36x2	28	113	83	33	41
	1CE48-28-16	25	1	-16	25.4	M36x2	28	113	83	33	41
	1CE48-28-20	31	1 1/4	-20	31.8	M36x2	28	142	95	40	41
	1CE48-35-20	31	1 1/4	-20	31.8	M45x2	35	141	94	37	50
1CE46-35-20		31	1 1/4	-20	31.8	M45x2	35	130	92	32	50
	1CE48-42-24	38	1 1/2	-24	38.1	M52x2	42	155	117	49	60

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.

Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or **48** | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

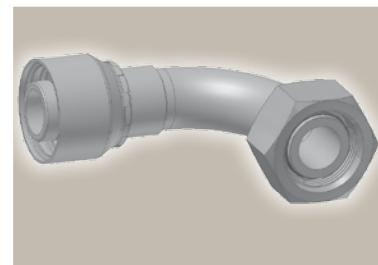
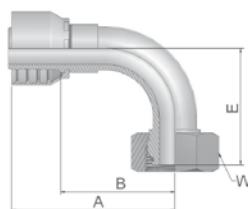
46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

CF
**Female Metric 24°
Light Series with O-Ring
Swivel – 90° Elbow**

ISO 12151-2-SWE-L – DKOL 90°



Part Number		Hose I.D.				Thread metric	Tube O.D. mm	A mm	B mm	E mm	W mm
46 series	48 series	DN	Inch	Size	mm						
1CF46-6-4	1CF48-6-4	6	1/4	-4	6.4	M12x1.5	6	57	33	33	14
1CF46-8-4	1CF48-8-4	6	1/4	-4	6.4	M14x1.5	8	51	28	29	17
1CF46-10-4	1CF48-10-4	6	1/4	-4	6.4	M16x1.5	10	52	28	29	19
1CF46-12-4	1CF48-12-4	6	1/4	-4	6.4	M18x1.5	12	53	26	29	22
1CF46-8-5	1CF48-8-5	8	5/16	-5	7.9	M14x1.5	8	62	38	34	17
1CF46-10-5	1CF48-10-5	8	5/16	-5	7.9	M16x1.5	10	61	37	29	19
1CF46-12-5	1CF48-12-5	8	5/16	-5	7.9	M18x1.5	12	61	37	30	22
1CF46-10-6	1CF48-10-6	10	3/8	-6	9.5	M16x1.5	10	60	37	37	19
1CF46-12-6	1CF48-12-6	10	3/8	-6	9.5	M18x1.5	12	58	35	36	22
1CF46-15-6	1CF48-15-6	10	3/8	-6	9.5	M22x1.5	15	58	35	36	27
1CF46-12-8	1CF48-12-8	12	1/2	-8	12.7	M18x1.5	12	63	39	45	22
1CF46-15-8	1CF48-15-8	12	1/2	-8	12.7	M22x1.5	15	61	37	43	27
1CF46-18-8	1CF48-18-8	12	1/2	-8	12.7	M26x1.5	18	65	41	43	32
1CF46-15-10	1CF48-15-10	16	5/8	-10	15.9	M22x1.5	15	67	42	50	27
1CF46-18-10	1CF48-18-10	16	5/8	-10	15.9	M26x1.5	18	66	41	45	32
1CF46-22-10	1CF48-22-10	16	5/8	-10	15.9	M30x2	22	71	46	47	36
1CF46-18-12	1CF48-18-12	19	3/4	-12	19.1	M26x1.5	18	80	54	56	32
1CF46-22-12	1CF48-22-12	19	3/4	-12	19.1	M30x2	22	80	54	55	36
1CF46-28-12	1CF48-28-12	19	3/4	-12	19.1	M36x2	28	80	54	57	41
1CF46-22-16	1CF48-22-16	25	1	-16	25.4	M30x2	22	102	72	74	36
1CF46-28-16	1CF48-28-16	25	1	-16	25.4	M36x2	28	101	72	71	41
	1CF48-22-20	31	1 1/4	-20	31.8	M30x2	22	130	83	81	36
	1CF48-28-20	31	1 1/4	-20	31.8	M36x2	28	129	82	81	41
1CF46-28-20		31	1 1/4	-20	31.8	M36x2	28	124	86	81	41
	1CF48-35-20	31	1 1/4	-20	31.8	M45x2	35	130	83	79	50
1CF46-35-20		31	1 1/4	-20	31.8	M45x2	35	124	86	79	50
	1CF48-35-24	38	1 1/2	-24	38.1	M45x2	35	139	101	99	50
1CF46-42-24		38	1 1/2	-24	38.1	M52x2	42	139	101	101	60

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.
 Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or
48 | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

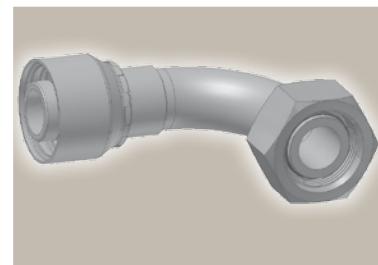
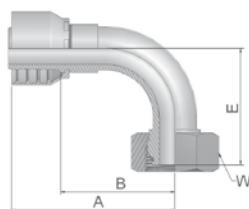
46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

CF
**Female Metric 24°
Light Series with O-Ring
Swivel – 90° Elbow**

ISO 12151-2-SWE-L – DKOL 90°



Part Number		Hose I.D.				Thread metric	Tube O.D. mm	A mm	B mm	E mm	W mm
46 series	48 series	DN	Inch	Size	mm						
1CF46-6-4	1CF48-6-4	6	1/4	-4	6.4	M12x1.5	6	57	33	33	14
1CF46-8-4	1CF48-8-4	6	1/4	-4	6.4	M14x1.5	8	51	28	29	17
1CF46-10-4	1CF48-10-4	6	1/4	-4	6.4	M16x1.5	10	52	28	29	19
1CF46-12-4	1CF48-12-4	6	1/4	-4	6.4	M18x1.5	12	53	26	29	22
1CF46-8-5	1CF48-8-5	8	5/16	-5	7.9	M14x1.5	8	62	38	34	17
1CF46-10-5	1CF48-10-5	8	5/16	-5	7.9	M16x1.5	10	61	37	29	19
1CF46-12-5	1CF48-12-5	8	5/16	-5	7.9	M18x1.5	12	61	37	30	22
1CF46-10-6	1CF48-10-6	10	3/8	-6	9.5	M16x1.5	10	60	37	37	19
1CF46-12-6	1CF48-12-6	10	3/8	-6	9.5	M18x1.5	12	58	35	36	22
1CF46-15-6	1CF48-15-6	10	3/8	-6	9.5	M22x1.5	15	58	35	36	27
1CF46-12-8	1CF48-12-8	12	1/2	-8	12.7	M18x1.5	12	63	39	45	22
1CF46-15-8	1CF48-15-8	12	1/2	-8	12.7	M22x1.5	15	61	37	43	27
1CF46-18-8	1CF48-18-8	12	1/2	-8	12.7	M26x1.5	18	65	41	43	32
1CF46-15-10	1CF48-15-10	16	5/8	-10	15.9	M22x1.5	15	67	42	50	27
1CF46-18-10	1CF48-18-10	16	5/8	-10	15.9	M26x1.5	18	66	41	45	32
1CF46-22-10	1CF48-22-10	16	5/8	-10	15.9	M30x2	22	71	46	47	36
1CF46-18-12	1CF48-18-12	19	3/4	-12	19.1	M26x1.5	18	80	54	56	32
1CF46-22-12	1CF48-22-12	19	3/4	-12	19.1	M30x2	22	80	54	55	36
1CF46-28-12	1CF48-28-12	19	3/4	-12	19.1	M36x2	28	80	54	57	41
1CF46-22-16	1CF48-22-16	25	1	-16	25.4	M30x2	22	102	72	74	36
1CF46-28-16	1CF48-28-16	25	1	-16	25.4	M36x2	28	101	72	71	41
	1CF48-22-20	31	1 1/4	-20	31.8	M30x2	22	130	83	81	36
	1CF48-28-20	31	1 1/4	-20	31.8	M36x2	28	129	82	81	41
1CF46-28-20		31	1 1/4	-20	31.8	M36x2	28	124	86	81	41
	1CF48-35-20	31	1 1/4	-20	31.8	M45x2	35	130	83	79	50
1CF46-35-20		31	1 1/4	-20	31.8	M45x2	35	124	86	79	50
	1CF48-35-24	38	1 1/2	-24	38.1	M45x2	35	139	101	99	50
1CF46-42-24		38	1 1/2	-24	38.1	M52x2	42	139	101	101	60

Hose fittings are delivered with ozone resistant Nitrile (NBR) O-ring as a standard version. Working temperature from -40 °C up to +105 °C.
 Hose fittings with special O-rings (Viton or EPDM) available on request. O-ring dimensions and part-numbers see in section Eb.

Approved **fitting series** for hose types:

Also available in stainless steel. Details can be found in CAT 4400.1/UK

46 or
48 | 441 | 441RH | 461LT | 462 | 462ST | 462CLF | 462TC

46 | 463 | 492 | 492ST | 492TC | 692 | 692TWIN

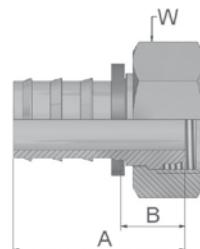
48 | 301SN | 301TC | 304 | 387 | 387ST | 387TC | 421RH | 421SN | 426 | 436 | ...

| 471TC | 477 | 477ST | 477TC | 487 | 487ST | 487TC | 493 | 811 | 881

C3

**Female Metric
Light Series – Swivel
Straight (Ball Nose for 24°
or 60° Cone)**

DKL



Part Number	Hose I.D.				Thread metric	Tube O.D. mm	A mm	B mm	W mm
	DN	Inch	Size	mm					
3C382-6-4	6	1/4	-4	6.4	M12x1.5	6	33	14	14
3C382-6-4BK	6	1/4	-4	6.4	M12x1.5	6	33	14	14
3C382-6-4B	6	1/4	-4	6.4	M12x1.5	6	33	14	14
3C382-8-4	6	1/4	-4	6.4	M14x1.5	8	33	14	17
3C382-8-4BK	6	1/4	-4	6.4	M14x1.5	8	36	17	19
3C382-8-4B	6	1/4	-4	6.4	M14x1.5	8	36	17	19
3C382-10-4	6	1/4	-4	6.4	M16x1.5	10	34	15	19
3C382-10-4BK	6	1/4	-4	6.4	M16x1.5	10	34	15	19
3C382-10-6	10	3/8	-6	9.5	M16x1.5	10	37	15	19
3C382-10-6BK	10	3/8	-6	9.5	M16x1.5	10	40	17	19
3C382-10-6B	10	3/8	-6	9.5	M16x1.5	10	40	17	19
3C382-12-6BK	10	3/8	-6	9.5	M18x1.5	12	40	17	22
3C382-12-6	10	3/8	-6	9.5	M18x1.5	12	38	16	22
3C382-15-8	12	1/2	-8	12.7	M22x1.5	15	42	15	27
3C382-15-8B	12	1/2	-8	12.7	M22x1.5	15	46	19	27
3C382-15-8BK	12	1/2	-8	12.7	M22x1.5	15	46	19	27
3C382-15-10	16	5/8	-10	15.9	M22x1.5	15	56	19	27
3C382-18-10B	16	5/8	-10	15.9	M26x1.5	18	58	22	32
3C382-18-10	16	5/8	-10	15.9	M26x1.5	18	53	17	32
3C382-18-10BK	16	5/8	-10	15.9	M26x1.5	18	58	22	32
3C382-22-12B	19	3/4	-12	19.1	M30x2	22	58	22	36
3C382-22-12	19	3/4	-12	19.1	M30x2	22	53	17	36
3C382-22-12BK	19	3/4	-12	19.1	M30x2	22	58	22	36
3C382-28-16	25	1	-16	25.4	M36x2	28	58	22	41
3C382-28-16-K	25	1	-16	25.4	M36x2	28	58	22	41
3C382-28-16BK	25	1	-16	25.4	M36x2	28	58	22	41

82 Series

Also available in stainless steel. Details can be found in CAT 4400.1/UK

Approved **fitting series** for hose types:

K: without plastic ring; B: Brass; SM: Metric Hexagon

82 801 804 821FR 830M 831 836 837BM 837PU 838M

421RH

No-Skive

Fire-retardant cover

Primary Applications

General medium-pressure hydraulic and pneumatic systems as well as water and oil cooling circuits

Type Approvals

Details please find on pages **Ab-16** to **Ab-19**

Applicable Specifications

EN 853 1SN – ISO 1436 Typ 1 – SAE 100R1AT

Construction

Tube: Nitrile (NBR)

Reinforcement: One high-tensile steel wire braid

Cover: Fire retardant synthetic rubber

Temperature Range -40 °C up to +100 °C

Exception: Air max. +70 °C
Water max. +85 °C



- **No-Skive** thin cover hose construction
- Nitrile (NBR) inner tube
 - extended fluid compatibility
- Suitable with 48 series fittings
- Fire-retardant cover
- Railway approved as follow:
European Standard EN45545 +
ISO15540: HL2
(without the need of FS-F-Fire Sleeve)

Recommended Fluids

Petroleum and water-glycol based fluids, lubricating oils, air and water. For air and gas above 1.7 MPa, the hose cover must be pin-pricked.

Consult the chemical compatibility section on pages **Ab-26** to **Ab-34** for more detailed information.

Fitting Series



Part Number	Hose I.D.				Hose O.D. mm	Pressure Rating				min. bend radius mm	weight kg
	DN	Inch	Size	mm		max. working pressure MPa	psi	min. burst pressure MPa	psi		
421RH-20	31	1 1/4	-20	31.8	44.8	6.3	900	25.0	3600	420	1.19
421RH-24	38	1 1/2	-24	38.1	51.1	5.0	725	20.0	2900	500	1.49
421RH-32	51	2	-32	50.8	64.7	4.0	575	16.0	2300	630	2.23

The combination of high temperature and high pressure could reduce the hose life.

Hose layline example

Parker RAIL HOSE 421RH-24 WP 5.0 MPa (725 PSI) | • DN 38 (1.1/2) - ISO1436-1

441RH

No-Skive Compact

Fire-retardant cover

Primary Applications

General medium-pressure hydraulic and pneumatic systems as well as water and oil cooling circuits

Type Approvals

Details please find on pages **Ab-16** to **Ab-19**

Applicable Specifications

Parker specification; Working pressure to SAE 100R2;
Bend radius to SAE 100R16

Construction

Tube: Synthetic rubber

Reinforcement: One high-tensile steel wire braid

Cover: Fire retardant synthetic rubber

Temperature Range -40 °C up to +125 °C

Exception: Air max. +70 °C
Water max. +85 °C



- **No-Skive** hose construction
- One wire braid construction
 - two wire braid performance
- +125 °C working temperature
- Fire-retardant cover
- Railway approved as follow:
European Standard EN45545 +
ISO15540: HL2
(without the need of FS-F-Fire Sleeve)

Recommended Fluids

Petroleum and water-glycol based fluids, lubricating oils, air and water. For air and gas above 1.7 MPa, the hose cover must be pin-pricked.

Consult the chemical compatibility section on pages **Ab-26** to **Ab-34** for more detailed information.

Fitting Series



Part Number	Hose I.D.				Hose O.D. mm	Pressure Rating				min. bend radius mm	weight kg
	DN	Inch	Size	mm		max. working pressure MPa	psi	min. burst pressure MPa	psi		
441RH-4	6	1/4	-4	6.4	13.4	35.0	5000	140.0	20000	50	0.27
441RH-5	8	5/16	-5	7.9	15.0	29.7	4250	118.8	17000	55	0.32
441RH-6	10	3/8	-6	9.5	17.4	28.0	4000	112.0	16000	65	0.42
441RH-8	12	1/2	-8	12.7	20.7	24.5	3500	98.0	14000	90	0.50
441RH-10	16	5/8	-10	15.9	23.8	19.2	2750	76.8	11000	100	0.65
441RH-12	19	3/4	-12	19.1	27.8	15.7	2250	62.8	9000	120	0.80
441RH-16	25	1	-16	25.4	35.8	14.0	2000	56.0	8000	150	1.22

The combination of high temperature and high pressure could reduce the hose life.

Hose layline example

RAIL HOSE 441RH-10 WP 19.2 MPa (2750 PSI) | • • DN 16 (5/8) - ISO1436-1

M12 FEMALE 0°

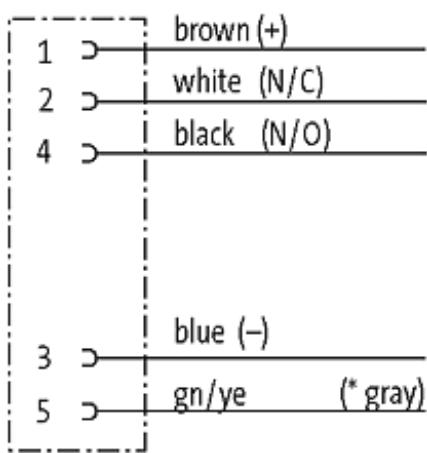
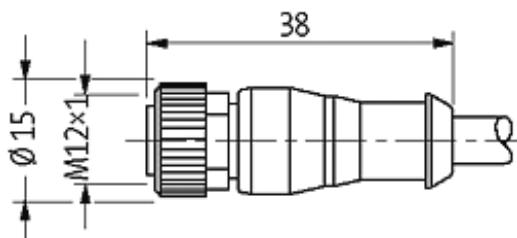
PUR 5X0.34 black UL/CSA, drag ch 5m

Female straight

5-pole

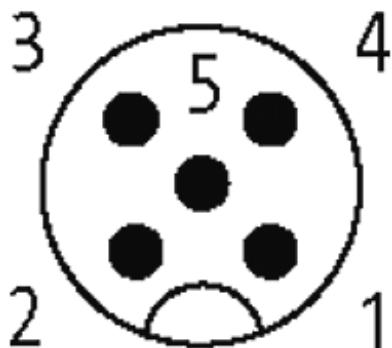
Art.-No. 7005 - M12 Lite - (plastic hexagonal screw) on request

Plastic housings with good resistance against chemicals and oils. The resistance to aggressive media should be individually tested for your application. Further details on request. Further cable lengths on request.

Link to Product**Illustration**

(* for cable type 126 and 732)

Female



Product may differ from Image

Approvals



* only for products with UL/CSA approved cable

Form

12241

Technical Data

Operating voltage	max. 125 V AC/DC
Operating current per contact	max. 4 A
Locking of ports	Screw thread M12 × 1 mm (recommended torque 0.6 Nm) self-securing
Protection	IP67 inserted and tightened (EN 60529)

Cables

Cable number	635
No./diameter of wires	5 × 0.34 mm ²
Wire isolation	PP (br, wh, bl, bk, gnye)
C-track properties	5 million
Torsion	2 Mio. ± 180 °/m
Jacket Color	black
Shore hardness outer jacket	90 ± 5A
Material (jacket)	PUR (UL/CSA)
Outer diameter	approx. 5.0 mm
Bend radius (fixed)	5 × outer diameter
Bend radius (moving)	10 × outer diameter
Temperature range (fixed)	-40...+80 °C

The information in this brochure has been compiled with the utmost care.

Liability for the correctness completeness and topicality of the information is restricted to gross negligence. Version: 11/14

Temperature range (mobile) -25...+80 °C

General data

Temperature range -25...+85 °C, depending on cable quality

Commercial data

country of origin CZ

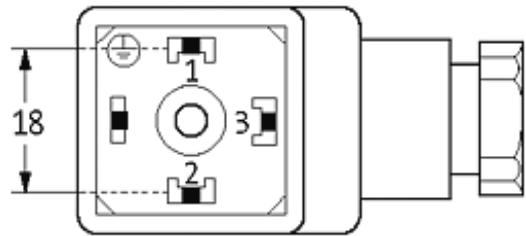
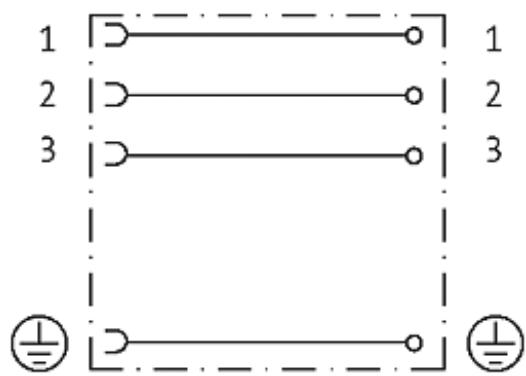
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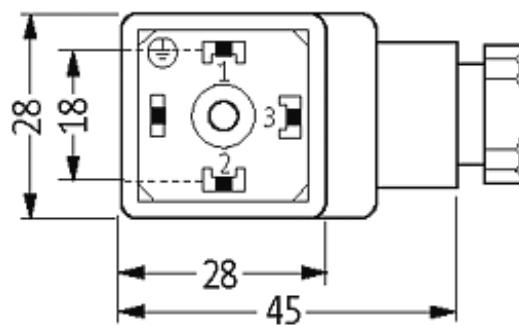
minimum order quantity 1

SVS ECO VALVE PLUG FORM A 18MM 230V

3+PE field-wireable M16x1.5

Form A (18 mm) for pressure switch
0...230 V AC/DC, without components
metric

[Link to Product](#)**Illustration**



Height: 31 mm

Product may differ from Image

Approvals**Form**

29405

Technical Data

Operating voltage	0...230 V AC/DC
Operating current per contact	max. 10 A
Connection cross section	0.5...1.5 mm ²
Sealing range (cable diameter)	6...8 mm
Locking of ports	M3 (recommended torque 0.4 Nm)
Contact figure	Cable outlet can be turned in 90° steps
Compression gland	M16 × 1.5 mm
Protection	IP65 inserted and tightened

General data

Temperature range	-40...+80 °C
-------------------	--------------

Commercial data

country of origin	HU
customs tariff number	85369010
minimum order quantity	1

The blueglobe® principle Benefits

A blueglobe® gland body

Materials: Nickel plated brass
Stainless steel, 1.4305 (AISI 303)
Polyamide (PA)
Metric connection thread
WEEE and RoHS conformity

B Pure elastic sealing insert

Material: TPE, blue
Temperature range -40°C up to 130°C
Halogen and plasticiser free
High UV-stability
UL 94 HB
WEEE and RoHS conformity

C Highest protection rate IP 68, up to 15 bar

D Radial symmetric, large area elastic sealing

Soft pressing by patented "globe" sealing system
No cable damages by notching and strangling reasons
No folding of the sealing in case of small diameters

E Inlet removable

F Brass: O-ring groove located at an outer position
PA: Self tightening area
Metric connection thread

G Highest strain relief (EN 50262 class B)

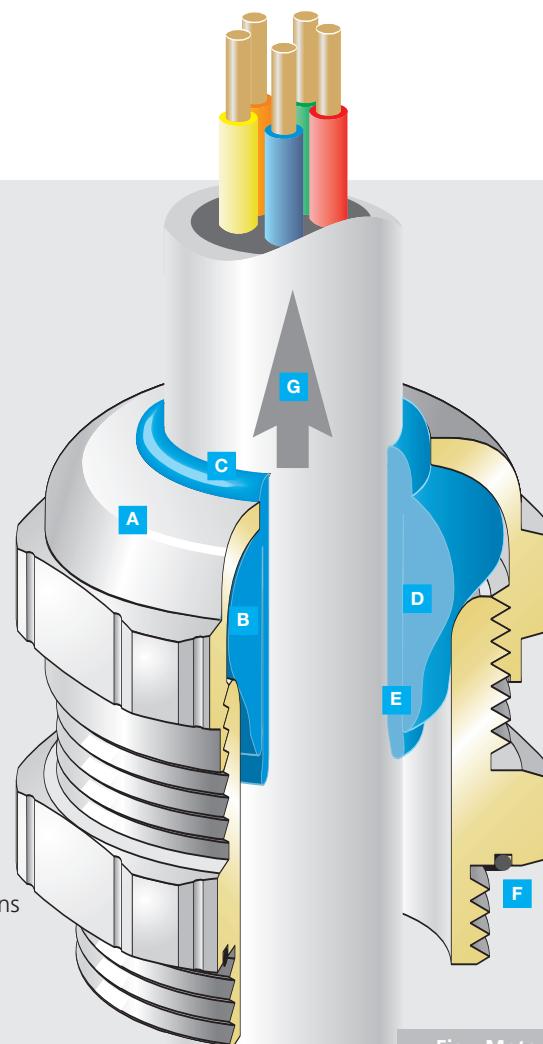


Fig.: Material brass,
VDE EN 50262
and UL 514 B
in preparation

Widest sealing ranges

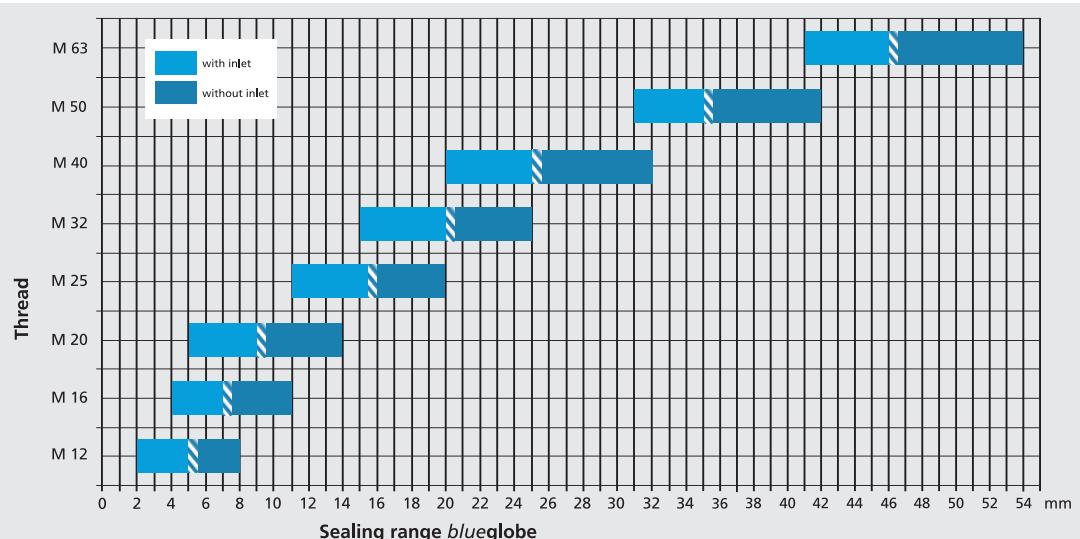


Diagram 1

Brass

blueglobe®

Brass nickel plated, metric connection thread as per EN 50262
Type of protection: IP 68, up to 15 bar over the whole sealing range

Sealing insert

Material	Temperature range	Colour
TPE	-40 °C up to +130 °C	blue (RAL 5012)

Gland body

Material	Execution
brass	galv. nickel plated



Fig. 1

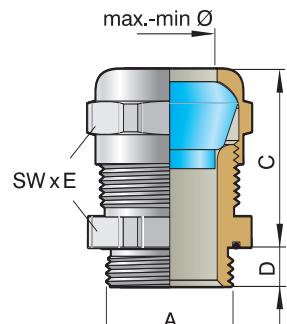


Fig. 2 with inlet

Connection thread/length		Article No.	Sealing range	Sealing range without inlet	C	Spanner width SW x E	
A	D		max./min. Ø mm	max./min. Ø mm	mm	mm	
M12x1,5	5	bg212 ms	8 – 2	8 – 5	21	17x18,9	50
M16x1,5	6	bg216 ms	11 – 4	11 – 7	25	20x22,2	50
M20x1,5	6,5	bg220 ms	14 – 5	14 – 9	29	24x26,5	50
M25x1,5	7,5	bg225 ms	20 – 11	20 – 15,5	29	30x33	50
M32x1,5	8	bg232 ms	25 – 15	25 – 20	32	36x39,5	25
M40x1,5	8	bg240 ms	32 – 20	32 – 26	35	45x48	10
M50x1,5	10	bg250 ms	42 – 31	42 – 35	35	57x61	5
M63x1,5	10	bg263 ms	54 – 41	54 – 46	38	68x74	5
M85x2		bg285 ms	in preparation				

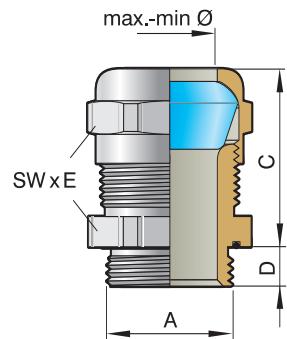


Fig. 3 without inlet

Connection thread/length		Article No.	Sealing range	Sealing range without inlet	C	Spanner width SW x E	
A	D		max./min. Ø mm	max./min. Ø mm	mm	mm	
M12x1,5	15	bg812 ms	8 – 2	8 – 5	21	17x18,9	50
M16x1,5	15	bg816 ms	11 – 4	11 – 7	25	20x22,2	50
M20x1,5	15	bg820 ms	14 – 5	14 – 9	29	24x26,5	50
M25x1,5	15	bg825 ms	20 – 11	20 – 15,5	29	30x33	50
M32x1,5	15	bg832 ms	25 – 15	25 – 20	32	36x39,5	25
M40x1,5	15	bg840 ms	32 – 20	32 – 26	35	45x48	10
M50x1,5	15	bg850 ms	42 – 31	42 – 35	35	57x61	5
M63x1,5	15	bg863 ms	54 – 41	54 – 46	38	68x74	5

(blueglobe reaches/exceeds partly the test requirements of EN 50262, as per Pflitsch laboratory)

Tightening torques for brass and stainless steel pressure screws and double nipple

Thread	M12	M16	M20	M25	M32	M40	M50	M63
Nm	5	8	10	15	15	20	30	35

Test value as per EN50262 x1,5

Ball Valve Series BVGL

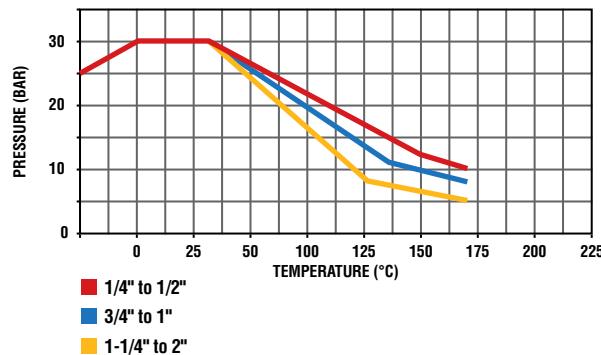


Product Features:

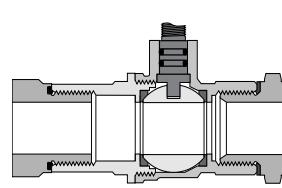
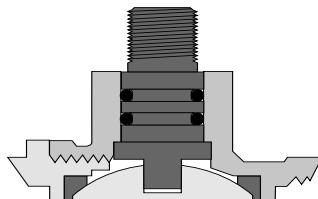
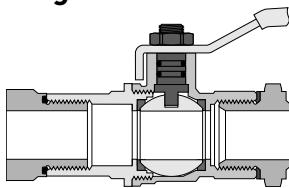
- Nickel plated brass body
- Chrome plated brass ball
- PTFE seats/seals
- Fluorocarbon stem seal

Specifications:

- Female threads manufactured in accordance to DIN 2999/ISO 228



Advantages



Long female threads

BVGL series valves are manufactured with long female threads in accordance to DIN 2999/ISO 228. This enables the valves to be used with Prestolok and brass adaptors but also Parker's range of steel hydraulic fittings, e.g. Triple-Lok, O-Lok, EO, and BSPP coned adaptors.

Anti extrusion stem

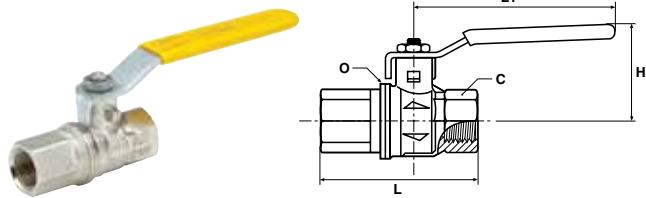
The BVGL series ball valves are fitted with an anti extrusion stem to prevent blow out in the case of pressure peaks. The stem is sealed with two Fluorocarbon O-rings for maximum safety and performance.

Full flow

All BVGL series valves are full-flow. This limits the turbulence created by the passage of fluid across the valve, minimizing pressure drop.

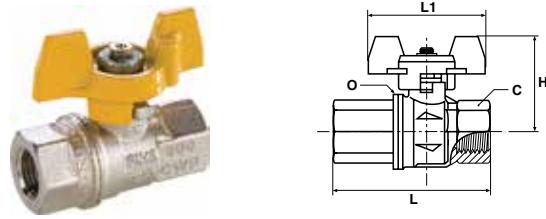
**BVGL BSPP Female/Female Valve
with Lever Handle**

PART NO.	DN MM	THREAD BSPP	C	H	L	L1	O
BVG4-1/4L	8	1/4	20	38	50	82	25.0
BVG4-3/8L	10	3/8	20	38	60	82	25.0
BVG4-1/2L	15	1/2	25	43	75	100	32.5
BVG4-3/4L	20	3/4	32	50	80	120	39.0
BVG4-1L	25	1	41	54	90	120	47.5
BVG4-1.1/4L	32	1 1/4	50	73	110	158	59.0
BVG4-1.1/2L	40	1 1/2	55	79	120	158	71.5
BVG4-2L	50	2	70	86	140	158	86.0



**BVGTL BSPP Female/Female Valve
with Compact Handle**

PART NO.	DN MM	THREAD BSPP	C	H	L	L1	O
BVGT4-1/4L	8	1/4	20	39	50	50	25.0
BVGT4-3/8L	10	3/8	20	39	60	50	25.0
BVGT4-1/2L	15	1/2	25	43	75	50	32.5
BVGT4-3/4L	20	3/4	32	47	80	60	39.0
BVGT4-1L	25	1	41	51	90	60	47.5





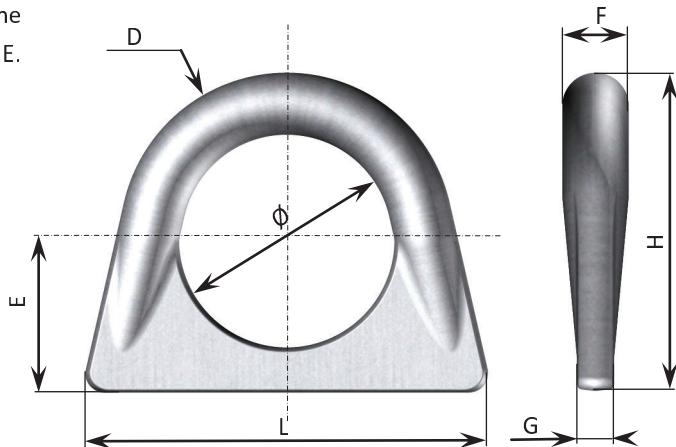
Anneau de levage à souder

Modèle H



Caractéristiques techniques

- ◆ Accessoire de levage conforme à la directive européenne machines 89/392/CEE modifiée par la directive 98/37/CEE.
- ◆ Acier C22 selon norme NF-EN 10083 - 1 -2 & 3
- ◆ Anneau forgé
- ◆ Marquage en relief
- ◆ Coefficient de sécurité : 5
- ◆ Notice d'utilisation et de maintenance : CM 14-02



Ø	H	L	E	D	F	G	CMU en Kg	Poids en g	Référence
24	43.5	54.5	21.5	21.5	9	5	200	60	22-01-001
31	55	68	27	28	12.5	6.5	500	140	22-01-002
43	67	85.5	32	35	13	6.5	1 000	180	22-01-003
48	82	105	39	43	18	7.5	2 000	400	22-01-004
57	95	128	45	50	21	10	3 000	660	22-01-005
67	107	148	51.5	55.5	25	13.5	4 000	1 020	22-01-006
82	135	189	66	69	28	16	6 000	1 920	22-01-007
100	165	210	84.5	80.5	30	21	8 000	3 120	22-01-008

Finition standard

- ◆ Grenaillée



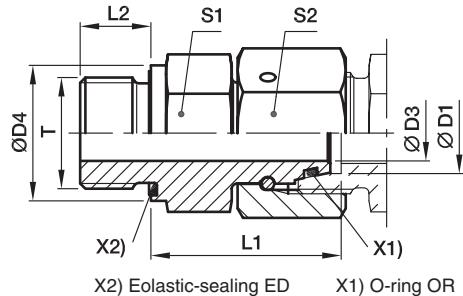
Notre catalogue est disponible sur le web

www.colin-milas.com

com@colin-milas.com

EGE-R-ED Swivel connector

Male BSPP thread – ED-seal (ISO 1179) / EO 24° DKO swivel



Series	D1	T	D3	D4	L1	L2	S1	S2	Weight g/1 piece	Order code*	PN (bar) ¹⁾	CF	71
L ³⁾	06	G 1/8 A	2.5	14	24.5	8	14	14	27	EGE06LRED	500	315	
	08	G 1/4 A	4.0	19	29.5	12	19	17	28	EGE08LRED	500	315	
	10	G 1/4 A	6.0	19	27.5	12	19	19	54	EGE10LRED	500	315	
	10	G 3/8 A	6.0	22	29.0	12	22	19	70	EGE10LR3/8ED	400		
	12	G 3/8 A	8.0	22	34.0	12	22	22	95	EGE12LRED	400	315	
	12	G 1/4 A	6.0	19	27.5	12	19	22	65	EGE12LR1/4ED	400		
	12	G 1/2 A	8.0	27	29.5	14	27	22	114	EGE12LR1/2ED	400		
	15	G 1/2 A	10.0	27	32.0	14	27	27	137	EGE15LRED	400	315	
	18	G 1/2 A	13.0	27	31.5	14	27	32	143	EGE18LRED	400	315	
	18	G 3/4 A	13.0	32	29.5	16	32	32	182	EGE18LR3/4ED	250		
	22	G 3/4 A	17.0	32	32.5	16	32	36	200	EGE22LRED	250	160	
	28	G 1 A	22.0	40	35.0	18	41	41	289	EGE28LRED	250	160	
	35	G 1 1/4 A	28.0	50	42.5	20	50	50	500	EGE35LRED	250	160	
	42	G 1 1/2 A	34.0	55	46.5	22	55	60	718	EGE42LRED	250	160	
	S ⁴⁾	06	G 1/4 A	2.5	19	27.0	12	19	17	53	EGE06SRED	800	630
	08	G 1/4 A	4.0	19	29.5	12	19	19	64	EGE08SRED	800	630	
	10	G 3/8 A	6.0	22	32.0	12	22	22	93	EGE10SRED	800	630	
	12	G 3/8 A	8.0	22	34.0	12	22	24	100	EGE12SRED	630	630	
	12	G 1/4 A	5.0	19	31.5	12	19	24	140	EGE12SR1/4ED	630		
	12	G 1/2 A	8.0	27	35.0	14	27	24	140	EGE12SR1/2ED	630	630	
	14	G 1/2 A	9.0	27	36.5	14	27	27	157	EGE14SRED	630	630	
	16	G 1/2 A	11.0	27	37.0	14	27	30	170	EGE16SRED	630	400	
	20	G 3/4 A	14.0	32	43.0	16	32	36	273	EGE20SRED	420	400	
	25	G 1 A	18.0	40	48.0	18	41	46	493	EGE25SRED	420	400	
	30	G 1 1/4 A	23.0	50	51.0	20	50	50	691	EGE30SRED	420		
	38	G 1 1/2 A	30.0	55	60.0	22	55	60	934	EGE38SRED	420	315	

1) Pressure shown = item deliverable

3) L = light series; 4) S = heavy series

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

Information on ordering alternative sealing materials see page I7.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	EGE16SREDCF	NBR
Stainless Steel	71	EGE16SRED71	VIT

Column level indicators stainless steel assembly screws



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• Screws, nuts and washers

AISI 303 stainless steel screws, AISI 304 stainless steel nuts and washers.

• Flat gaskets

FKM type VITON® O-Ring.

• Plate

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Standard executions

- HCX-SST: without thermometer.

- HCX/T-SST: with incorporated thermometer.

• Mounting

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions

Level visibility and temperature reading magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.76-SST 18 bar
- HCX.127-SST 18 bar
- HCX.254-SST 12 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

- UV resistant transparent technopolymer indicators.
- Indicators with two red ball-shaped floats (only for HCX-SST executions).

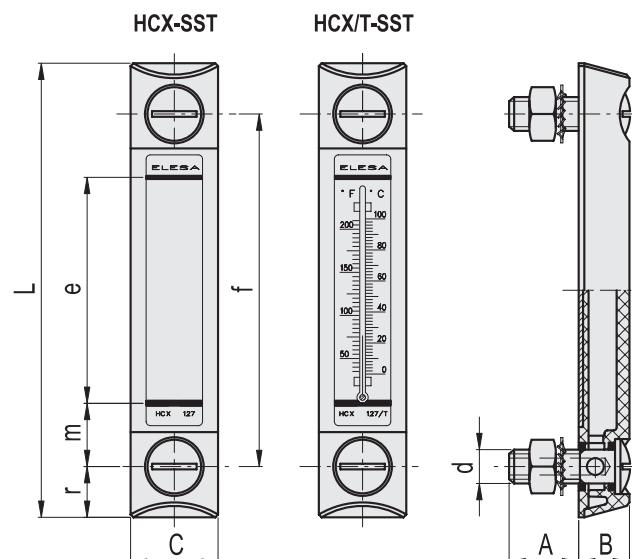
Other standard executions

- HCX-AR for use with fluids containing alcohol.
- HCX-BW-SST for use with hot water.

* Registered trademark by DuPont Dow Elastomers.



Drilling template
Holes without burrs and chamfer



HCX-SST

Code	Description	f	d	A	B	C	L	e	m	r	$d^{+0.2}$	$f^{\pm 0.2}$	Thermometer scale °C	Thermometer scale °F	C# [Nm]	$\Delta\Delta$
11343	HCX.76-SST-M10	76	M10	22	16	27	107	40	18	15.5	10.5	76	-	-	12 87	
11348	HCX.76/T-SST-M10	76	M10	22	16	27	107	40	18	15.5	10.5	76	20÷100	68÷210	12 87	
11353	HCX.127-SST-M12	127	M12	23	18	31	161	80	23	17	12.5	127	-	-	12 138	
11358	HCX.127/T-SST-M12	127	M12	23	18	31	161	80	23	17	12.5	127	0÷100	32÷210	12 138	
11363	HCX.254-SST-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	-	-	10 185	
11368	HCX.254/T-SST-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	0÷100	32÷210	10 185	

Maximum tightening torque.

Double-valve pressurised breather caps



• Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- Cover: RAL 2004 orange, semi-matte finish, with graphic symbol "valve".
- Threaded connector: black colour, semi-matte finish.

• Packing ring

NBR synthetic rubber.

• Overpressure valve

Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.

Set at around 0.350 bar (0.700 bar on request).

• Suction valve

Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.

Set at around 0.030 bar.

• Ring-shaped air filter

"Tech-foam" polyurethane foam mesh (polyester base), air filtration 40 µ.

• Flat dipstick

Flat section phosphatised steel.

On request and for sufficient quantities dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.

• Standard executions

- **SFW+F:** without flat dipstick.
- **SFW-BA+F:** with zinc-plated steel sheet bayonet, without flat dipstick.
Chrome-plated steel safety chain.
- **SFW+F+a:** with flat dipstick.
- **SFW-BA+F+a:** with zinc-plated steel sheet bayonet and flat dipstick.
Chrome-plated steel safety chain.

• Maximum continuous working temperature

100°C.

Features

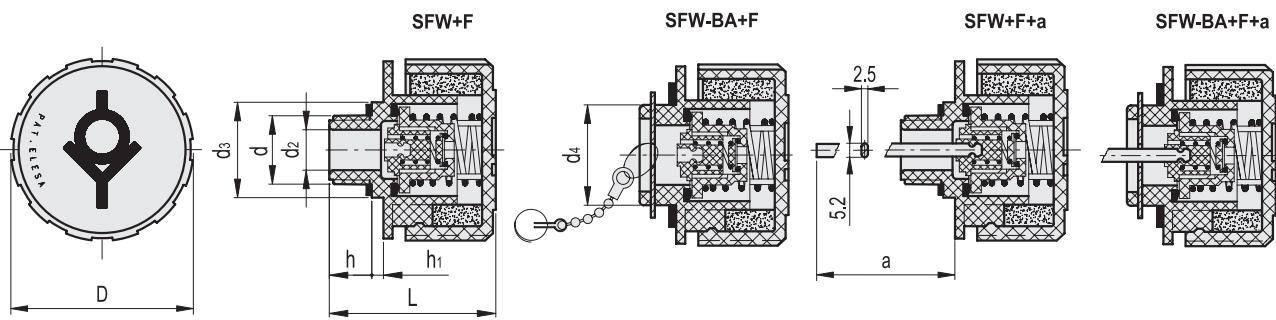
The use of SFW. pressurised breather caps which create a pressure plenum chamber right above the oil level within tested limit conditions, in order to avoid any reservoir deformation, offers the following advantages:

- reduces reservoir air volume intake keeping clean oil and filter
- improves suction pump action during working conditions reducing cavitation phenomenon
- prevents fluid leakage when the system is part of a mobile unit
- reduces foam in fluid.

Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.





SFW+F

Code	Description	d	D	L	d ₂	d ₃	h	h ₁	kg
54801	SFW.57-3/4+F-350 mb	G 3/4	57	48	16	35	13	6	67
54911	SFW.70-3/4+F-350 mb#	G 3/4	70	63	16	35	15	6	98
54921	SFW.70-1 1/4+F-350 mb	G1 1/4	70	59	23	-	17	-	101
54931	SFW.70-2+F-350 mb	G 2	70	59	23	-	17	-	108

Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

SFW-BA+F

Code	Description	D	L	d ₂	d ₄	h	kg
54941	SFW.70-BA+F-350 mb	70	56	25	39	14	105

SFW+F+a

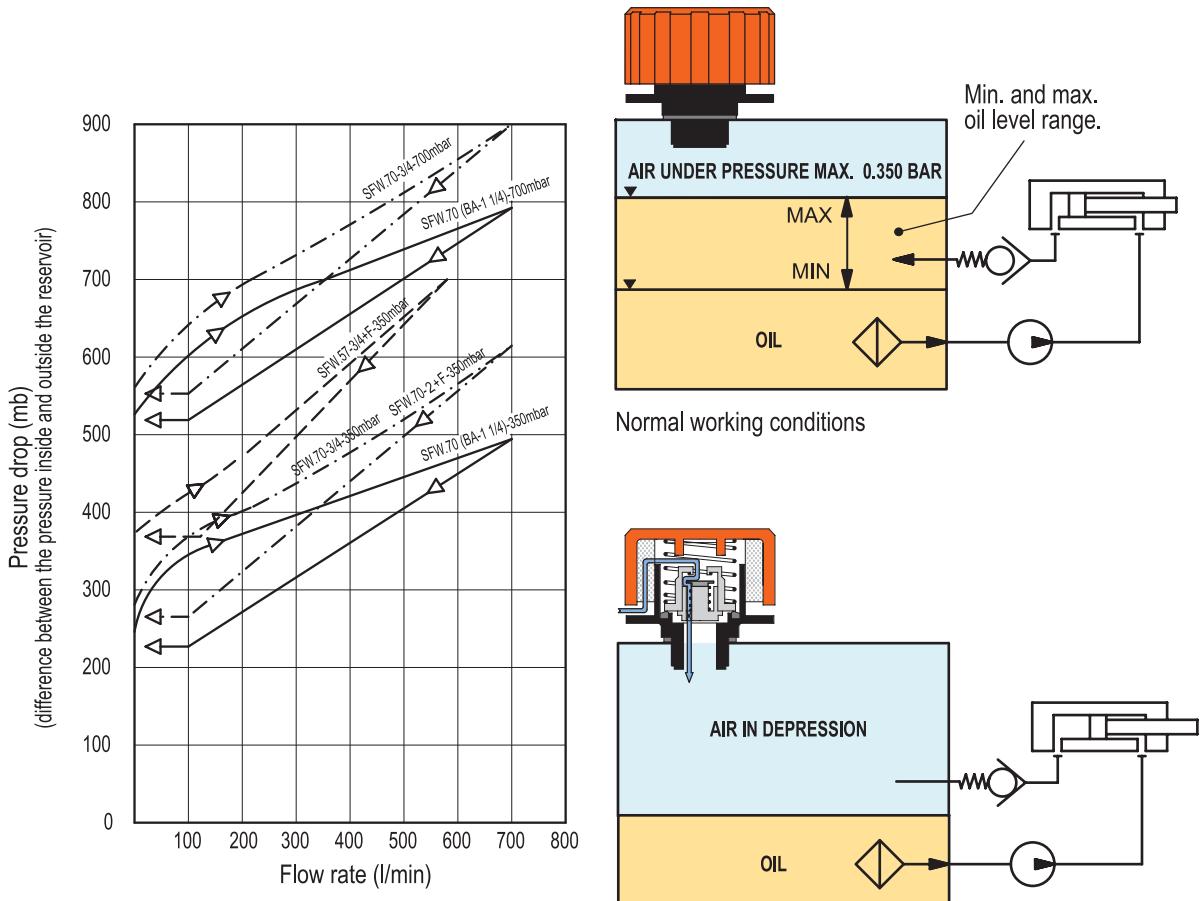
Code	Description	d	D	L	d ₂	d ₃	h	h ₁	a	kg
54913	SFW.70-3/4+F+a-350 mb#	G 3/4	70	63	16	35	15	6	188	117
54923	SFW.70-1 1/4+F+a-350 mb	G1 1/4	70	59	23	-	17	-	195	120

Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

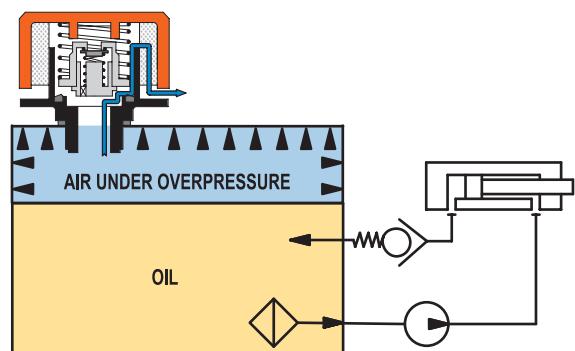
SFW-BA+F+a

Code	Description	D	L	d ₂	d ₄	h	a	kg
54943	SFW.70-BA+F+a-350 mb	70	56	25	39	14	195	124

SFW. pressurised breather cap functioning in a hydraulic circuit



When in the reservoir a depression under 0.030 bar is produced, a flux of air entering the reservoir through the suction valve takes place.

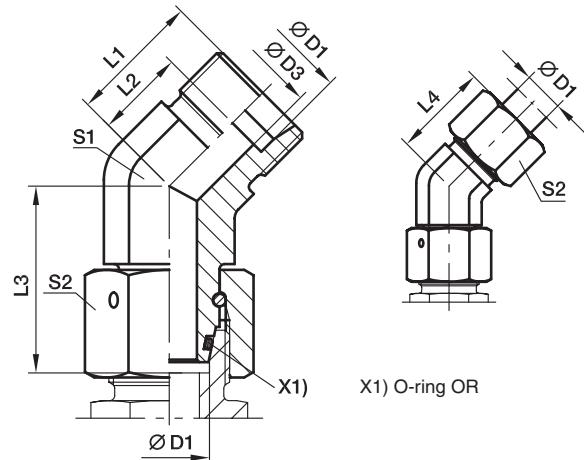


When in the reservoir an over pressure exceeding 0.350 (or 0.700) bar is produced, a flux of air is discharged through the safety valve.



EV Swivel nut 45° elbow

EO 24° cone end / EO 24° DKO swivel



Series	D1	D3	L1	L2	L3	L4	S1	S2	Weight g/1 piece	PN (bar) ¹⁾	
										Order code*	CF
L ³⁾	06	4	16.0	9.0	26.0	24	14	14	37	EV06LOMD	315
	08	6	19.0	12.0	27.5	27	14	17	49	EV08LOMD	315
	10	8	19.0	12.0	29.0	27	19	19	77	EV10LOMD	315
	12	10	21.0	14.0	29.5	29	19	22	86	EV12LOMD	315
	15	12	24.0	17.0	32.5	32	22	27	144	EV15LOMD	315
	18	15	24.0	16.5	35.5	33	27	32	210	EV18LOMD	315
	22	19	26.0	18.5	38.5	35	30	36	270	EV22LOMD	160
	28	24	30.5	23.0	41.5	40	36	41	385	EV28LOMD	160
	35	30	37.0	26.5	51.0	48	50	50	805	EV35LOMD	160
	42	36	37.0	26.0	56.0	49	50	60	887	EV42LOMD	160
S ⁴⁾	06	4	16.0	9.0	27.0	24	14	17	50	EV06SOMD	630
	08	5	19.0	12.0	27.5	27	19	19	80	EV08SOMD	630
	10	7	21.0	13.5	30.0	30	19	22	95	EV10SOMD	630
	12	8	24.0	16.5	31.0	33	22	24	137	EV12SOMD	630
	16	12	24.0	15.5	36.5	34	27	30	217	EV16SOMD	400
	20	16	26.5	16.0	44.5	38	30	36	313	EV20SOMD	400
	25	20	30.5	18.5	50.0	43	36	46	529	EV25SOMD	400
	30	25	37.0	23.5	55.0	50	50	50	940	EV30SOMD	400
	38	32	37.0	21.0	63.0	52	50	60	1055	EV38SOMD	315

¹⁾ Pressure shown = item deliverable

³⁾ L = light series; ⁴⁾ S = heavy series

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

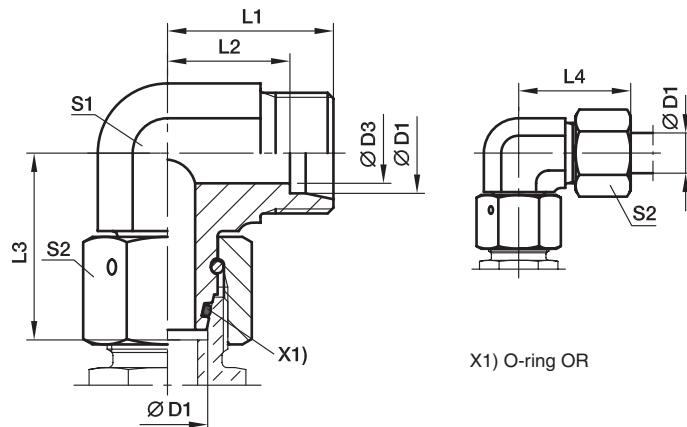
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page 17.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	EV16SOMDCF	NBR
Stainless Steel	71	EV16SOMD71	VIT

EW Swivel nut elbow

EO 24° cone end / EO 24° DKO swivel



X1) O-ring OR

Series	D1	D3	L1	L2	L3	L4	S1	S2	Weight g/1 piece	PN (bar) ¹⁾	
										Order code*	CF
L ³⁾	06	4	19	12.0	26.0	27	12	14	34	EW06LOMD	500
	08	6	21	14.0	27.5	29	12	17	43	EW08LOMD	500
	10	8	22	15.0	29.0	30	14	19	58	EW10LOMD	500
	12	10	24	17.0	29.5	32	17	22	81	EW12LOMD	400
	15	12	28	21.0	32.5	36	19	27	128	EW15LOMD	400
	18	15	31	23.5	35.5	40	24	32	197	EW18LOMD	400
	22	19	35	27.5	38.5	44	27	36	258	EW22LOMD	250
	28	24	38	30.5	41.5	47	36	41	370	EW28LOMD	250
	35	30	45	34.5	51.0	56	41	50	593	EW35LOMD	250
	42	36	51	40.0	56.0	63	50	60	993	EW42LOMD	250
S ⁴⁾	06	4	23	16.0	27.0	31	12	17	48	EW06SOMD	800
	08	5	24	17.0	27.5	32	14	19	65	EW08SOMD	800
	10	6	25	17.5	30.0	34	17	22	92	EW10SOMD	800
	12	8	29	21.5	31.0	38	17	24	107	EW12SOMD	630
	14	9	30	22.0	35.0	40	19	27	146	EW14SOMD	630
	16	12	33	24.5	36.5	43	24	30	212	EW16SOMD	630
	20	16	37	26.5	44.5	48	27	36	309	EW20SOMD	420
	25	20	42	30.0	50.0	54	36	46	547	EW25SOMD	420
	30	25	49	35.5	55.0	62	41	50	744	EW30SOMD	420
	38	32	57	41.0	63.0	72	50	60	1222	EW38SOMD	420

¹⁾ Pressure shown = item deliverable

³⁾ L = light series; ⁴⁾ S = heavy series

$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$

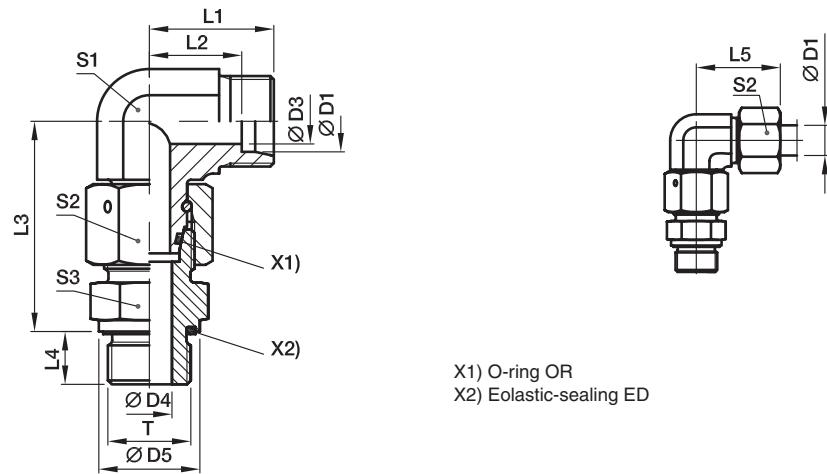
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page I7.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	EW16SOMDCF	NBR
Stainless Steel	71	EW16SOMD71	VIT

EW-M-ED Assembled adjustable swivel elbow

EO 24° cone end / Male metric thread – ED-seal (ISO 9974)



Series	D1	T	D3	D4	D5	L1	L2	L3	L4	L5	S1	S2	S3	Weight g/1 piece	PN (bar) ¹⁾		
															CF	71	
L ³⁾	06	M 10x1.0	4	4	14	19	12.0	34.5	8	27	12	14	14	47	EW06LMEDOMD	500	315
	08	M 12x1.5	6	6	17	21	14.0	37.5	12	29	12	17	17	69	EW08LMEDOMD	500	315
	10	M 14x1.5	8	7	19	22	15.0	40.0	12	30	14	19	19	87	EW10LMEDOMD	500	315
	12	M 16x1.5	10	9	22	24	17.0	42.0	12	32	17	22	22	111	EW12LMEDOMD	400	315
	15	M 18x1.5	12	11	24	28	21.0	46.0	12	36	19	27	24	179	EW15LMEDOMD	400	315
	18	M 22x1.5	15	14	27	31	23.5	50.0	14	40	24	32	27	272	EW18LMEDOMD	400	315
	22	M 26x1.5	19	18	32	35	27.5	55.0	16	44	27	36	32	360	EW22LMEDOMD	250	160
	28	M 33x2.0	24	23	40	38	30.5	59.0	18	47	36	41	41	538	EW28LMEDOMD	250	160
	35	M 42x2.0	30	30	50	45	34.5	68.5	20	56	41	50	50	843	EW35LMEDOMD	250	160
	42	M 48x2.0	36	36	55	51	40.0	75.0	22	63	50	60	55	1353	EW42LMEDOMD	250	160
S ⁴⁾	06	M 12x1.5	4	4	17	23	16.0	40.0	12	31	12	17	17	77	EW06SMEDOMD	800	630
	08	M 14x1.5	5	5	19	24	17.0	42.5	12	32	14	19	19	107	EW08SMEDOMD	800	630
	10	M 16x1.5	6	7	22	25	17.5	45.0	12	34	17	22	22	146	EW10SMEDOMD	800	630
	12	M 18x1.5	8	8	24	29	21.5	48.0	12	38	17	24	24	178	EW12SMEDOMD	630	630
	14	M 20x1.5	9	10	26	30	22.0	54.0	14	40	19	27	27	203	EW14SMEDOMD	630	630
	16	M 22x1.5	12	12	27	33	24.5	55.0	14	43	24	30	27	307	EW16SMEDOMD	630	400
	20	M 27x2.0	16	16	32	37	26.5	65.0	16	48	27	36	32	459	EW20SMEDOMD	420	400
	25	M 33x2.0	20	20	40	42	30.0	73.0	18	54	36	46	41	812	EW25SMEDOMD	420	400
	30	M 42x2.0	25	25	50	49	35.5	78.5	20	62	41	50	50	1167	EW30SMEDOMD	420	400
	38	M 48x2.0	32	32	55	57	41.0	89.0	22	72	50	60	55	1790	EW38SMEDOMD	420	315

¹⁾ Pressure shown = item deliverable³⁾ L = light series; ⁴⁾ S = heavy series

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

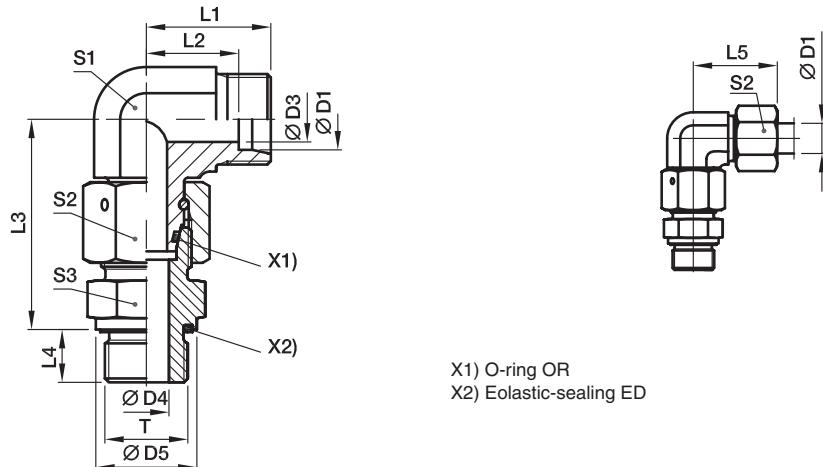
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page 17.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	EW16SMEDOMDCF	NBR
Stainless Steel	71	EW16SMEDOMD71	VIT

*Please add the **suffixes** below according to the material/surface required.

EW-R-ED Assembled adjustable swivel elbow

EO 24° cone end / Male BSPP thread – ED-seal (ISO 1179)



Series	D1	T	D3	D4	D5	L1	L2	L3	L4	L5	S1	S2	S3	Weight g/1 piece	PN (bar) ¹⁾		
															CF	71	
L3)	06	G 1/8 A	4	4	14	19	12.0	34.5	8	27	12	14	14	47	EW06LREDOMD	500	315
	08	G 1/4 A	6	6	19	21	14.0	37.5	12	29	12	17	19	69	EW08LREDOMD	500	315
	10	G 1/4 A	8	6	19	22	15.0	40.0	12	30	14	19	19	87	EW10LREDOMD	500	315
	12	G 3/8 A	10	9	22	24	17.0	42.0	12	32	17	22	22	122	EW12LREDOMD	400	315
	15	G 1/2 A	12	11	27	28	21.0	46.5	14	36	19	27	27	199	EW15LREDOMD	400	315
	18	G 1/2 A	15	14	27	31	23.5	50.0	14	40	24	32	27	268	EW18LREDOMD	400	315
	22	G 3/4 A	19	18	32	35	27.5	55.0	16	44	27	36	32	360	EW22LREDOMD	250	160
	28	G 1 A	24	23	40	38	30.5	59.0	18	47	36	41	41	539	EW28LREDOMD	250	160
	35	G 1 1/4 A	30	30	50	45	34.5	68.5	20	56	41	50	50	834	EW35LREDOMD	250	160
	42	G 1 1/2 A	36	36	55	51	40.0	75.0	22	63	50	60	55	1341	EW42LREDOMD	250	160
S4)	06	G 1/4 A	4	4	19	23	16.0	40.0	12	31	12	17	19	83	EW06SREDOMD	800	630
	08	G 1/4 A	5	5	19	24	17.0	42.5	12	32	14	19	19	106	EW08SREDOMD	800	630
	10	G 3/8 A	6	7	22	25	17.5	45.0	12	34	17	22	22	148	EW10SREDOMD	800	630
	12	G 3/8 A	8	8	22	29	21.5	48.0	12	38	17	24	22	170	EW12SREDOMD	630	630
	14	G 1/2 A	9	10	27	30	22.0	54.0	14	40	19	27	27	242	EW14SREDOMD	630	630
	16	G 1/2 A	12	12	27	33	24.5	55.0	14	43	24	30	27	303	EW16SREDOMD	630	400
	20	G 3/4 A	16	16	32	37	26.5	65.0	16	48	27	36	32	458	EW20SREDOMD	420	400
	25	G 1 A	20	20	40	42	30.0	73.0	18	54	36	46	41	813	EW25SREDOMD	420	400
	30	G 1 1/4 A	25	25	50	49	35.5	78.5	20	62	41	50	50	1163	EW30SREDOMD	420	400
	38	G 1 1/2 A	32	32	55	57	41.0	89.0	22	72	50	60	55	1784	EW38SREDOMD	420	315

¹⁾ Pressure shown = item deliverable

³⁾ L = light series; ⁴⁾ S = heavy series

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

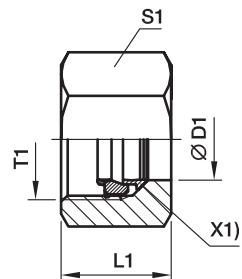
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page I7.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	EW16SREDOMDCF	NBR
Stainless Steel	71	EW16SREDOMD71	VIT

*Please add the **suffixes** below according to the material/surface required.

FM EO2-Functional nut

for steel tubes



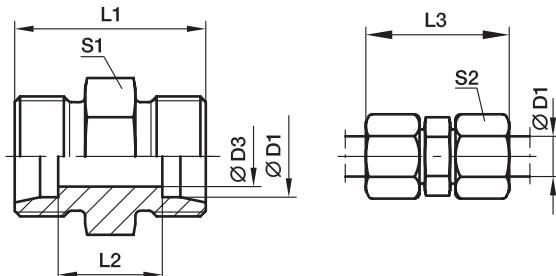
X1) Retaining ring

Series	D1 	T1	L1	S1	Order code		Weight g/1 piece		
					FM...CF Steel, zinc plated Cr(VI) free passiv. +Sealing Sealing NBR	PN (bar)			
LL	04	M 08x1.0	11.0	10	FM04LLCF	100	5		
	06	M 10x1.0	11.5	12		—			
L	06	M 12x1.5	14.5	14	FM06LCF	500	FM06LVITCF	500	12
	08	M 14x1.5	14.5	17		500	FM08LVITCF	500	17
	10	M 16x1.5	15.5	19		500	FM10LVITCF	500	22
	12	M 18x1.5	15.5	22		400	FM12LVITCF	400	30
	15	M 22x1.5	17.0	27		400	FM15LVITCF	400	48
	18	M 26x1.5	18.0	32	FM18LCF	400	FM18LVITCF	400	70
	22	M 30x2.0	20.0	36		250	FM22LVITCF	250	94
	28	M 36x2.0	21.0	41		250	FM28LVITCF	250	106
	35	M 45x2.0	24.0	50		250	FM35LVITCF	250	160
	42	M 52x2.0	24.0	60		250	FM42LVITCF	250	244
S	06	M 14x1.5	16.5	17	FM06SCF	800	FM06SVITCF	800	20
	08	M 16x1.5	16.5	19		800	FM08SVITCF	800	23
	10	M 18x1.5	17.5	22		800	FM10SVITCF	800	37
	12	M 20x1.5	17.5	24		630	FM12SVITCF	630	39
	14	M 22x1.5	20.5	27		630	FM14SVITCF	630	60
	16	M 24x1.5	20.5	30	FM16SCF	630	FM16SVITCF	630	72
	20	M 30x2.0	24.0	36		420	FM20SVITCF	420	121
	25	M 36x2.0	27.0	46		420	FM25SVITCF	420	221
	30	M 42x2.0	29.0	50		420	FM30SVITCF	420	248
	38	M 52x2.0	32.5	60		420	FM38SVITCF	420	367

$$\frac{PN \text{ (bar)}}{10} = PN \text{ (MPa)}$$

G Union

EO 24°cone end



Series	D1 	D3	L1	L2	L3	S1	S2	Weight g/1 piece	Order code*	PN (bar) ¹⁾		
										CF	71	MS
LL ²⁾	04	3.0	20	12	31	9	10	5	G04LL	100	100	63
	06	4.5	20	9	32	11	12	7	G06LL	100	100	63
	08	6.0	23	12	35	12	14	10	G08LL	100	100	63
	10	8.0	23	12	35	14	17	13	G10LL	100	100	63
	12	10.0	23	11	35	17	19	16	G12LL	100	100	63
L ³⁾	06	4.0	24	10	39	12	14	12	G06L	500	315	200
	08	6.0	25	11	40	14	17	16	G08L	500	315	200
	10	8.0	27	13	42	17	19	23	G10L	500	315	200
	12	10.0	28	14	43	19	22	28	G12L	400	315	200
	15	12.0	30	16	46	24	27	51	G15L	400	315	200
	18	15.0	31	16	48	27	32	69	G18L	400	315	200
	22	19.0	35	20	52	32	36	90	G22L	250	160	100
	28	24.0	36	21	54	41	41	137	G28L	250	160	100
	35	30.0	41	20	63	46	50	214	G35L	250	160	100
	42	36.0	43	21	66	55	60	296	G42L	250	160	100
S ⁴⁾	06	4.0	30	16	45	14	17	26	G06S	800	630	400
	08	5.0	32	18	47	17	19	37	G08S	800	630	400
	10	7.0	32	17	49	19	22	44	G10S	800	630	400
	12	8.0	34	19	51	22	24	60	G12S	630	630	400
	14	10.0	38	22	57	24	27	77	G14S	630	630	400
	16	12.0	38	21	57	27	30	90	G16S	630	400	250
	20	16.0	44	23	66	32	36	143	G20S	420	400	250
	25	20.0	50	26	74	41	46	251	G25S	420	400	250
	30	25.0	54	27	80	46	50	330	G30S	420	400	250
	38	32.0	61	29	90	55	60	545	G38S	420	315	200

¹⁾ Pressure shown = item deliverable

²⁾ LL = very light series; ³⁾ L = light series; ⁴⁾ S = heavy series

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

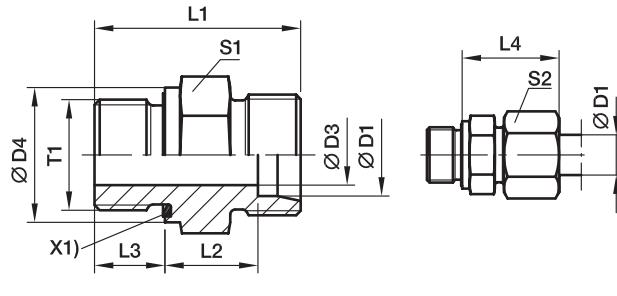
Delivery without nut and ring. Information on ordering complete fittings see page I7.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes		
Material	Suffix surface and material	Example
Steel, zinc plated, Cr(VI)-free	CFX	G16SCFX
Stainless Steel	71X	G16S71X
Brass	MSX	G16SMSX

GE-M-ED Male stud connector

Male metric thread – ED (ISO 9974) / EO 24° cone end



Series	D1 	T1	D3	D4	L1	L2	L3	L4	S1	S2	Weight g/1 piece	Order code*		PN (bar) ¹⁾	
												CF	71	CF	71
L ³⁾	06	M 10x1.0	4	14	23.5	8.5	8	23	14	14	13	GE06LMEDOMD		500	315
	08	M 12x1.5	6	17	29.0	10.0	12	25	17	17	22	GE08LMEDOMD		500	315
	10	M 14x1.5	7	19	30.0	11.0	12	26	19	19	29	GE10LMEDOMD		500	315
	10	M 12x1.5	6	17	30.0	11.0	12	26	17	19	23	GE10LM12X1.5EDOMD	315	315	
	10	M 16x1.5	8	22	31.5	12.5	12	24	22	19	40	GE10LM16X1.5EDOMD	420	315	
	10	M 18x1.5	8	24	31.5	12.5	12	27	24	19	50	GE10LM18X1.5EDOMD	400	315	
	10	M 22x1.5	8	27	35.0	14.0	14	29	27	19	80	GE10LM22X1.5EDOMD	400	315	
	12	M 16x1.5	9	22	31.5	12.5	12	27	22	22	40	GE12LMEDOMD	400	315	
	12	M 14x1.5	7	19	30.0	11.0	12	26	19	22	30	GE12LM14X1.5EDOMD	400	315	
	12	M 18x1.5	10	24	31.5	12.5	12	27	24	22	47	GE12LM18X1.5EDOMD	400	315	
S ⁴⁾	12	M 22x1.5	10	27	35.0	14.0	14	29	27	22	75	GE12LM22X1.5EDOMD	400	315	
	15	M 18x1.5	11	24	32.5	13.5	12	29	24	27	51	GE15LMEDOMD	400	315	
	15	M 16x1.5	9	22	32.0	13.0	12	28	24	27	64	GE15LM16X1.5EDOMD	400	315	
	15	M 22x1.5	12	27	36.0	15.0	14	30	27	27	77	GE15LM22X1.5EDOMD	400	315	
	18	M 22x1.5	14	27	36.0	14.5	14	31	27	32	74	GE18LMEDOMD	400	315	
	18	M 18x1.5	11	24	33.5	14.0	12	30	27	32	68	GE18LM18X1.5EDOMD	400	315	
	22	M 26x1.5	18	32	40.0	16.5	16	33	32	36	103	GE22LMEDOMD	250	160	
	22	M 22x1.5	14	32	38.0	16.5	14	33	32	36	97	GE22LM22X1.5EDOMD	250	160	
	28	M 33x2.0	23	40	43.0	17.5	18	34	41	41	168	GE28LMEDOMD	250	160	
	35	M 42x2.0	30	50	48.0	17.5	20	39	50	50	281	GE35LMEDOMD	250	160	
S ⁴⁾	42	M 48x2.0	36	55	52.0	19.0	22	42	55	60	356	GE42LMEDOMD	250	160	
	06	M 12x1.5	4	17	32.0	13.0	12	28	17	17	30	GE06SMEDOMD	800	630	
	08	M 14x1.5	5	19	34.0	15.0	12	30	19	19	42	GE08SMEDOMD	800	630	
	10	M 16x1.5	7	22	34.5	15.0	12	31	22	22	54	GE10SMEDOMD	800	630	
	12	M 18x1.5	8	24	36.5	17.0	12	33	24	24	71	GE12SMEDOMD	630	630	
	12	M 14x1.5	5	19	36.0	16.5	12	33	22	24	60	GE12SM14X1.5EDOMD	630	630	
	12	M 22x1.5	8	27	39.0	17.5	14	34	27	24	102	GE12SM22X1.5EDOMD	630	400	
	14	M 20x1.5	10	26	41.0	19.0	14	37	27	27	98	GE14SMEDOMD	630	630	
	16	M 22x1.5	12	27	41.0	18.5	14	37	27	30	95	GE16SMEDOMD	630	400	
	16	M 18x1.5	8	24	38.5	18.0	12	36	27	30	88	GE16SM18X1.5EDOMD	630	400	
S ⁴⁾	20	M 27x2.0	16	32	47.0	20.5	16	42	32	36	150	GE20SMEDOMD	420	400	
	25	M 33x2.0	20	40	53.0	23.0	18	47	41	46	264	GE25SMEDOMD	420	400	
	30	M 42x2.0	25	50	57.0	23.5	20	50	50	50	422	GE30SMEDOMD	420	400	
	38	M 48x2.0	32	55	64.0	26.0	22	57	55	60	569	GE38SMEDOMD	420	315	

1) Pressure shown = item deliverable

3) L = light series; 4) S = heavy series

PN (bar) = PN (MPa)
10

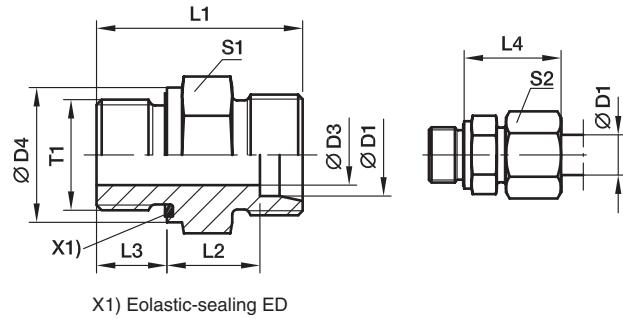
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page I7.

*Please add the below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	GE16SMEDOMDCF	NBR
Stainless Steel	71	GE16SMEDOMD71	VIT

GE-R-ED Male stud connector

Male BSPP thread – ED-seal (ISO 1179) / EO 24° cone end



Series	D1 	T1	D3	D4	L1	L2	L3	L4	S1	S2	Weight g/1 piece	PN (bar) ¹⁾			
												Order code*	CF	71	MS
LL ²⁾	04	G 1/8 A	3	14	20.0	9.5	6.5	19	14	10	10	GE04LLREDOMD	100	100	63
	06	G 1/8 A	4	14	20.0	8.0	6.5	20	14	12	11	GE06LLREDOMD	100	100	63
L ³⁾	06	G 1/8 A	4	14	23.5	8.5	8.0	23	14	14	13	GE06LREDOMD	500	315	200
	06	G 1/4 A	4	19	29.0	10.0	12.0	25	19	14	28	GE06LR1/4EDOMD	500	315	200
	06	G 3/8 A	4	22	30.5	11.5	12.0	26	22	14	44	GE06LR3/8EDOMD	420	315	200
	06	G 1/2 A	4	27	33.0	12.0	14.0	27	27	14	61	GE06LR1/2EDOMD	400	315	200
	08	G 1/4 A	6	19	29.0	10.0	12.0	25	19	17	27	GE08LREDOMD	500	315	200
	08	G 1/8 A	4	14	24.5	9.5	8.0	24	14	17	16	GE08LR1/8EDOMD	500	315	200
	08	G 3/8 A	6	22	30.5	11.5	12.0	26	22	17	45	GE08LR3/8EDOMD	420	315	200
	08	G 1/2 A	6	27	33.0	12.0	14.0	27	27	17	74	GE08LR1/2EDOMD	400	315	200
	10	G 1/4 A	6	19	30.0	11.0	12.0	26	19	19	29	GE10LREDOMD	500	315	200
	10	G 1/8 A	4	14	25.5	10.5	8.0	25	17	19	21	GE10LR1/8EDOMD	500	315	200
	10	G 3/8 A	8	22	31.5	12.5	12.0	27	22	19	43	GE10LR3/8EDOMD	420	315	200
	10	G 1/2 A	8	27	34.0	13.0	14.0	28	27	19	71	GE10LR1/2EDOMD	400	315	200
	12	G 3/8 A	9	22	31.5	12.5	12.0	27	22	22	41	GE12LREDOMD	420	315	200
	12	G 1/8 A	4	14	26.5	11.5	8.0	26	19	22	26	GE12LR1/8EDOMD	420	315	200
	12	G 1/4 A	6	19	31.0	12.0	12.0	27	19	22	31	GE12LR1/4EDOMD	400	315	200
	12	G 1/2 A	10	27	34.0	13.0	14.0	28	27	22	67	GE12LR1/2EDOMD	400	315	200
	12	G 3/4 A	10	32	37.0	14.0	16.0	29	32	22	118	GE12LR3/4EDOMD	250	160	100
	15	G 1/2 A	11	27	35.0	14.0	14.0	29	27	27	72	GE15LREDOMD	400	315	200
	15	G 3/8 A	9	22	32.5	13.5	12.0	29	24	27	54	GE15LR3/8EDOMD	400	315	200
	15	G 3/4 A	12	32	38.0	15.0	16.0	30	32	27	116	GE15LR3/4EDOMD	250	160	100
	18	G 1/2 A	14	27	36.0	14.5	14.0	31	27	32	71	GE18LREDOMD	400	315	200
	18	G 3/8 A	9	22	33.5	14.0	12.0	30	27	32	66	GE18LR3/8EDOMD	400	315	200
	18	G 3/4 A	15	32	38.0	14.5	16.0	31	32	32	110	GE18LR3/4EDOMD	250	160	100
	22	G 3/4 A	18	32	40.0	16.5	16.0	33	32	36	102	GE22LREDOMD	250	160	100
	22	G 1/2 A	14	27	38.0	16.5	14.0	33	32	36	91	GE22LR1/2EDOMD	250	160	100
	22	G 1 A	19	40	43.0	17.5	18.0	34	41	36	189	GE22LR1EDOMD	250	160	100
	28	G 1 A	23	40	43.0	17.5	18.0	34	41	41	170	GE28LREDOMD	250	160	100
	28	G 3/4 A	18	32	41.0	17.5	16.0	34	41	41	159	GE28LR3/4EDOMD	250	160	100
	28	G 1 1/4 A	24	50	46.0	18.5	20.0	35	50	41	316	GE28LR11/4EDOMD	250	160	100
	35	G 1 1/4 A	30	50	48.0	17.5	20.0	39	50	50	272	GE35LREDOMD	250	160	100
	35	G 1 A	23	40	46.0	17.5	18.0	39	46	50	226	GE35LR1EDOMD	250	160	100
	35	G 1 1/2 A	30	55	52.0	19.5	22.0	41	55	50	423	GE35LR11/2EDOMD	250	160	100
	42	G 1 1/2 A	36	55	52.0	19.0	22.0	42	55	60	343	GE42LREDOMD	250	160	100
	42	G 1 A	23	40	48.0	19.0	18.0	42	55	60	324	GE42LR1EDOMD	250	160	100
	42	G 1 1/4 A	30	50	50.0	19.0	20.0	42	55	60	348	GE42LR11/4EDOMD	250	160	100

¹⁾ Pressure shown = item deliverable

²⁾ LL = very light series; ³⁾ L = light series

PN (bar) = PN (MPa)
10

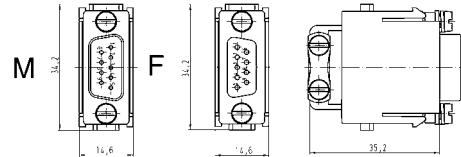
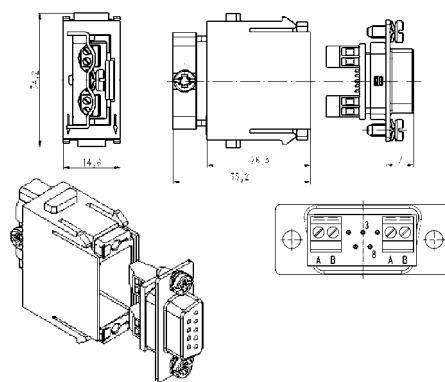
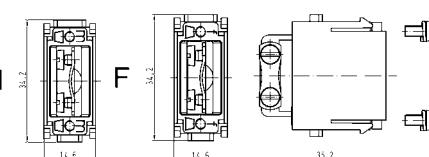
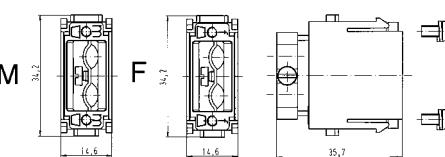
Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page 17.

*Please add the suffixes below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	GE18LREDOMDCF	NBR
Stainless Steel	71	GE18LREDOMD71	VIT
Brass	MS	GE18LREDOMDMS	NBR

Number of contacts

950 V
5 AHan-
Modular

Identification	Wire cross section (mm ²)	Part number male	female	Drawing Dimensions in mm
Han-Modular®, Han® D-Sub module, Crimp terminal  Please order crimp contacts separately.		09 14 009 3001	09 14 009 3101	
Han-Modular®, Han® D-Sub module, for RS 485-based bus systems with T-functionality, Screw terminal 	0.08 – 0.52	09 14 009 3151		 <p>Contact arrangement (view from termination side) Signal A: Contact no. 8 Signal B: Contact no. 3</p>
Han-Modular®, Adapter module, for one cable, for 9-pin D-Sub  Han-Modular®, Adapter module, for two cables, for 9-pin D-Sub 	09 14 000 9930 09 14 000 9932	09 14 000 9931	09 14 000 9933	 



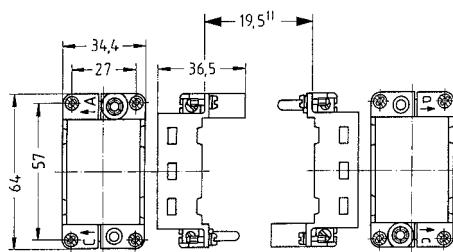
Identification

Han-Modular®,
Hinged frame,
for 3 modules,
A ... C



Part number

09 14 010 0303

Drawing
Dimensions in mm

Han-Modular®,
Hinged frame,
for 3 modules,
a ... c



09 14 010 0313

Han-Modular®,
Hinged frame HMC,
for 3 modules,
A ... C

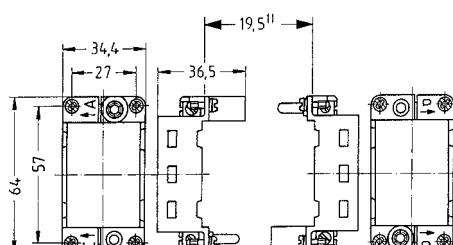


09 14 210 0303

Han-Modular®,
Hinged frame HMC,
for 3 modules,
a ... c

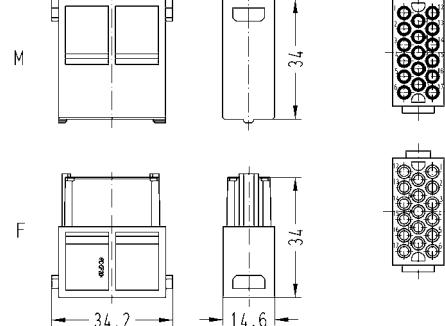
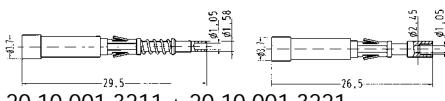


09 14 210 0313

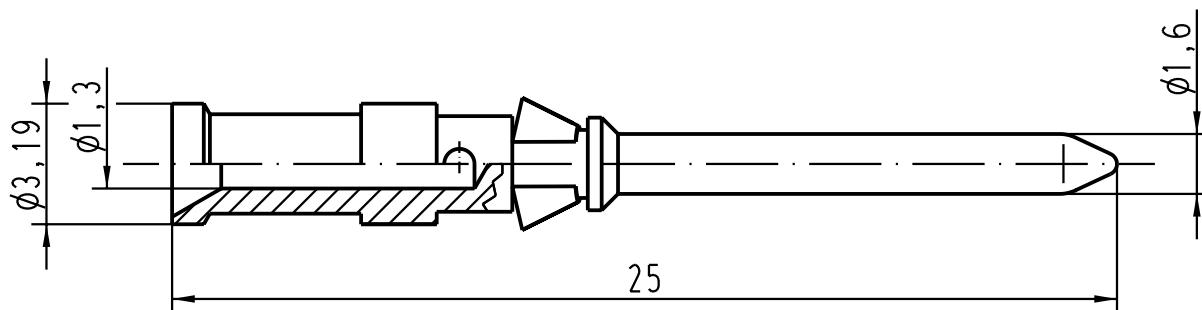


Number of contacts

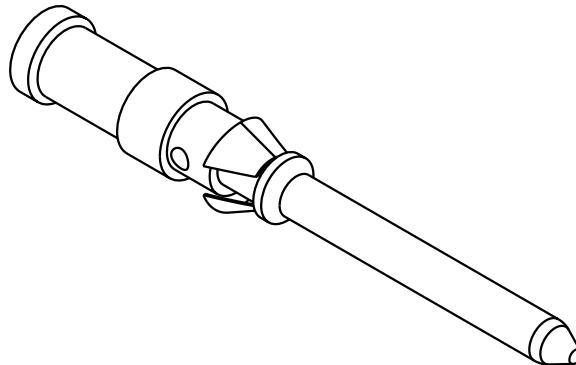
17160 V
10 AHan-
Modular

Identification	Wire cross section (mm ²)	Part number	Drawing Dimensions in mm																					
		male female																						
Han-Modular®, Han® DDD module, Crimp terminal  Please order crimp contacts separately.		09 14 017 3001 09 14 017 3101	 																					
Han D®, Crimp contact, gold plated contacts, contact resistance ≤3 mOhm 	0.14 – 0.37 0.5 0.75 1 1.5 2.5	09 15 000 6124 09 15 000 6123 09 15 000 6125 09 15 000 6122 09 15 000 6121 09 15 000 6126	 <table border="1"> <thead> <tr> <th>Wire gauge</th> <th>Ø</th> <th>Stripping length</th> </tr> </thead> <tbody> <tr> <td>0.14-0.37 mm² AWG 26-22</td> <td>0.9 mm</td> <td>8 mm</td> </tr> <tr> <td>0.5 mm² AWG 20</td> <td>1.1 mm</td> <td>8 mm</td> </tr> <tr> <td>0.75 mm² AWG 18</td> <td>1.3 mm</td> <td>8 mm</td> </tr> <tr> <td>1 mm² AWG 18</td> <td>1.45 mm</td> <td>8 mm</td> </tr> <tr> <td>1.5 mm² AWG 16</td> <td>1.75 mm</td> <td>8 mm</td> </tr> <tr> <td>2.5 mm² AWG 14</td> <td>2.25 mm</td> <td>6 mm</td> </tr> </tbody> </table>	Wire gauge	Ø	Stripping length	0.14-0.37 mm ² AWG 26-22	0.9 mm	8 mm	0.5 mm ² AWG 20	1.1 mm	8 mm	0.75 mm ² AWG 18	1.3 mm	8 mm	1 mm ² AWG 18	1.45 mm	8 mm	1.5 mm ² AWG 16	1.75 mm	8 mm	2.5 mm ² AWG 14	2.25 mm	6 mm
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2.5 mm ² AWG 14	2.25 mm	6 mm																						
F.O. contact for 1 mm plastic fibre 		20 10 001 3211 20 10 001 3221	 																					

A



B



Leiterquerschnitt/wire gauge: $0,75\text{mm}^2$ / AWG 18
 Oberfläche/surface: Gold Tec (NiP+Au)

C

 All Dimensions in mm Original Size DIN A 4			Techn. Character.			Nicht tolerierte Massen/Free size tolerances	
	Dat.	Name		Dat.	Name	Massstab/Scale	
	Detail.	14.05.04	Loe.				
	Insp.		KR				
	Stand.						
411022							
Mod.	Dat.	Name					
			HARTING Electric GmbH & Co. KG D-32339 Espelkamp			 TB 09 15 000 6305	
						Sub.	Blatt/page

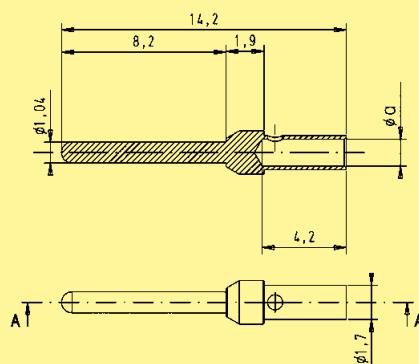


Turned crimp contacts

Identification	Wire gauge (mm ²)	Part No.		
		Male contacts	Female contacts	High-end female contacts
		Performance level 1*	Performance level 1*	Performance level 1*
Individual contacts ¹⁾	AWG 22-18 0.33-0.82	09 67 000 3576	09 67 000 3476	09 67 000 3676
	AWG 24-20 0.25-0.52	09 67 000 8576	09 67 000 8476	09 67 000 8676
	AWG 26-22 0.13-0.33	09 67 000 5576	09 67 000 5476	09 67 000 5676
	AWG 28-24 0.09-0.25	09 67 000 7576	09 67 000 7476	09 67 000 7676

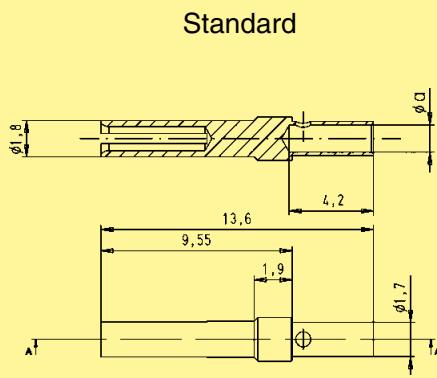
¹⁾ Minimum order 100 pieces or multiples of 100

Male contacts

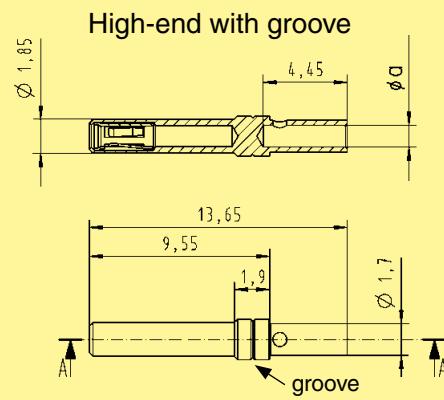


	a	groove
AWG 22-18	1.34	none
AWG 24-20	1.13	1
AWG 26-22	0.88	2
AWG 28-24	0.64	3

Female contacts



Standard



High-end with groove

* Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512
Use crimp tool with the part no. 09 99 000 0501 and the locator with the part no. 09 99 000 0531. Details see chapter 20

Number of contacts

9-50

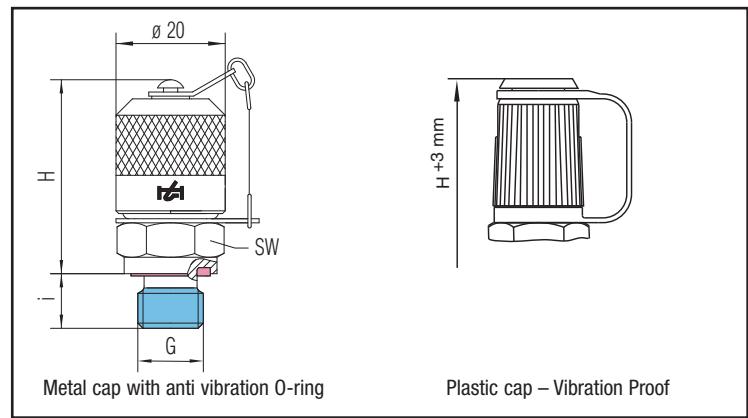
Crimp terminal

Identification	No. of contacts	Part No.																								
Male connector Order contacts separately metal shell with dimples	9 15 25 37 50	09 67 009 5601 09 67 015 5601 09 67 025 5601 09 67 037 5601 09 67 050 5601																								
Female connector Order contacts separately metal shell	9 15 25 37 50	09 67 009 4701 09 67 015 4701 09 67 025 4701 09 67 037 4701 09 67 050 4701																								
Male connector		<p style="text-align: center;">9-37 50</p>																								
Female connector		<p style="text-align: center;">9-37 50</p>																								
Panel cut out for front/rear mount <small>Values are taken from the CECC 75 301-802</small>		<table border="1"> <thead> <tr> <th></th> <th>a</th> <th>b_{±0.1}</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>30.9</td> <td>25.0</td> <td>12.5</td> </tr> <tr> <td>15</td> <td>39.2</td> <td>33.3</td> <td>12.5</td> </tr> <tr> <td>25</td> <td>53.1</td> <td>47.0</td> <td>12.5</td> </tr> <tr> <td>37</td> <td>69.4</td> <td>63.5</td> <td>12.5</td> </tr> <tr> <td>50</td> <td>67.0</td> <td>61.1</td> <td>15.4</td> </tr> </tbody> </table> <p>see page 05.24</p>		a	b _{±0.1}	c	9	30.9	25.0	12.5	15	39.2	33.3	12.5	25	53.1	47.0	12.5	37	69.4	63.5	12.5	50	67.0	61.1	15.4
	a	b _{±0.1}	c																							
9	30.9	25.0	12.5																							
15	39.2	33.3	12.5																							
25	53.1	47.0	12.5																							
37	69.4	63.5	12.5																							
50	67.0	61.1	15.4																							

double locking lever

Identification	Cable entry	Low construction	High construction	Part number	Drawing Dimensions in mm
Han® B, Hoods, top entry	1xM20 1xM25 1xM32 1xM40 2xM20	19 30 010 1420 19 30 010 1421		19 30 010 0427 19 30 010 0428 19 30 010 0465	
Han® B, Hoods, side entry	1xM20 1xM25 1xM32	19 30 010 1520 19 30 010 1521		19 30 010 0527	

MINIMESS®-1620 Test Points



Thread G	Type of seal A	Torque in Nm	Technical data				Material: Free cutting steel 1.0718	Metal cap	Part-number with NBR - sealing	Material: Free cutting steel 1.0718	Plastic cap	Part-number with NBR - sealing	Material: Stainless steel 1.4571	Metal cap	Part-number with FKM - sealing
			p max	H in mm	i in mm	SW in mm									
M 8 x 1*	Form G	6	25 MPa	41	8,5	17	2103-01-32.00		2103-30-32.00		2103-30-33.00		2103-01-33.00		2103-30-33.00
M 10 x 1		12		37,5	8,5	17	2103-01-13.00		2103-30-13.00		2103-30-13.00		2103-01-14.00		2103-30-14.00
M 12 x 1,5	Form F	30	63 MPa	36	10	17	2103-01-14.00		2103-30-15.00		2103-30-15.00		2103-01-15.00		2103-30-96.00
M 14 x 1,5		40		36	10	19	2103-01-17.00		2103-30-17.00		2103-30-17.00		2103-01-17.00		2703-01-17.10
M 16 x 1,5	Form E**	60		36	10	22	2103-01-18.00		2103-30-18.00		2103-30-18.00		2103-01-18.00		2703-01-18.10
M 14 x 1,5		45		35,5	11	19	2103-01-16.00		2103-30-16.00		2103-30-16.00		2103-01-46.00		2103-30-46.00
ISO 228-G 1/8	Form F	18	40 MPa	38	8	17	2103-01-47.00		2103-30-47.00		2103-30-47.00		2103-01-47.00		2703-01-47.10
ISO 228-G 1/4		40	63 MPa	36	10	19	2103-01-21.00		2103-30-53.00		2103-30-53.00		2103-01-21.00		2703-01-21.00
ISO 228-G 3/8	Form E	60		36	10	22	2103-01-40.00		2103-30-40.00		2103-30-40.00		2103-01-41.00		2703-01-41.00
1/8 NPTF		–	40 MPa	33	9,5	17	2103-01-46.00		2103-30-46.00		2103-30-46.00		2103-01-47.00		2703-01-47.10
1/4 NPTF	Form H	–	40 MPa	33	16,5	17	2103-01-21.00		2103-30-21.00		2103-30-21.00		2103-01-21.00		2703-01-21.00
7/16-20 UNF		20		37	9	17	2103-01-53.00		2103-30-53.00		2103-30-53.00		2103-01-40.00		2703-01-40.00
9/16-18 UNF	Form C	35	63 MPa	36	10	19	2103-01-41.00		2103-30-41.00		2103-30-41.00		2103-01-40.00		2703-01-40.00
ISO 7/I-R 1/8		–		33	13	17	2103-01-40.00		2103-30-40.00		2103-30-40.00		2103-01-41.00		2703-01-41.00
ISO 7/I-R 1/4		–	63 MPa	33	13	17	2103-01-41.00		2103-30-41.00		2103-30-41.00		2103-01-40.00		2703-01-40.00

* M8x1 - Please do not use for new machinery design.

** Form E – ISO 6149-2.

Option

For sealing in FKM (Viton) Exchange end digits from 00 to 10

10

Other materials, designs, sealing and screw-in threads on request.
We reserve the right to carry out technical modifications.

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Internet: www.jumo.net

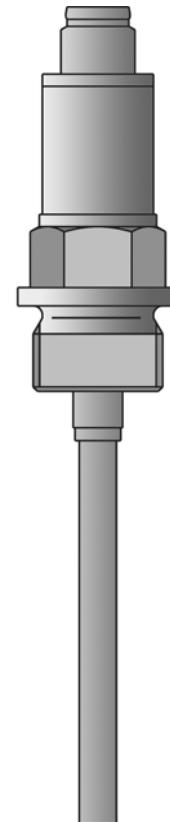
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Fax: 315-697-5867
E-mail: info@jumo.us
Internet: www.jumo.us



JUMO Dtrans T100 Screw-in RTD temperature probe with/without transmitter

- for temperatures from -50 to +260 °C
- EHEDG certification
- complies with ROHS for EU and China
- configuration by setup program via USB interface
- M12 x 1 plug connection; IP67 protection according to EN 60529
with machine connector plugged in
- Product with an integrated transmitter is not intended for export to the USA!



The screw-in RTD temperature probe, which has a compact design, consists of a sheath with an integrated temperature sensor, a process connection, and an attached housing for the transmitter electronics. The built-in programmable 2-wire transmitter converts the resistance value into a current signal.

The screw-in RTD temperature probe and the programmable 2-wire transmitter are used for measuring temperatures from -50 to +150 °C (-58 to +302 °F) or to 260 °C (500 °F) with an extension piece (without the transmitter: -50 to +200 °C or -58 to +392 °F).

The range, fine calibration or measuring circuit monitoring etc. can all be configured with the help of a setup program.

The 4 to 20 mA or (reversed) 20 to 4 mA output signal that is provided is linear with temperature. The instrument is designed for industrial applications and complies with the European standards for assuring electromagnetic compatibility (EMC).

The transmitter must be protected from temperatures above 85 °C !

Technical data

Electrical connection

machine connector M12 x 1, 4-pole according to IEC 60947-5-2; FIXCON-capable

Process connection

G 3/8 (3/8" pipe) thread

G 1/2 (1/2" pipe) thread

G 1/2 (1/2" pipe) thread with CIP-compliant conical seal, with EHEDG certification
taper nipple with cap nut (milk pipe screw fitting)

clamping nipple according to DIN 32676

ball weld-in socket with clamping thread

weld-in socket with CIP-compliant conical seal

Varivent connections with EHEDG certification

ball weld-in socket

JUMO PEKA with EHEDG certification

Sheath

stainless steel 316 L (Mat. Ref. 1.4404/1.4435);

stainless steel 316 Ti (Mat. Ref. 1.4571) (on request)

Protection type

IP67 protection according to EN 60529, with the machine connector plugged in

Response time

water 0.4 m/s sheath standard $t_{0.5} = 5$ s; $t_{0.9} = 12$ s

water 0.4 m/s sheath stepped $t_{0.5} = 2$ s; $t_{0.9} = 5$ s

air 3.0 m/s sheath standard $t_{0.5} = 40$ s; $t_{0.9} = 110$ s

air 3.0 m/s sheath stepped $t_{0.5} = 21$ s; $t_{0.9} = 70$ s

Measuring insert

without transmitter: Pt100 or Pt1000 temperature sensor, EN 60751, Class A, B or AA (1/3 Class B),

2- or 4-wire circuit

with programmable transmitter:

Pt1000 temperature sensor, EN 60751, Class A,

4-wire circuit

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 Internet: www.jumo.us



Technical data (general)

Input

Measurement input	without transmitter: Pt100 or Pt1000 temperature sensor, EN 60751, Class A, B or AA (1/3 Class B), 2- or 4-wire circuit with programmable transmitter: Pt1000 temperature sensor, EN 60751, Class A, 4-wire circuit
Measuring ranges	Basic type 902815/10... : -50 to +200 °C Basic type 902815/20... : -50 to +150 °C Basic type 902815/21... : -50 to +260 °C with extension
Tolerance limits	0.15 + 0.002 × t ¹ , Class A (standard) 0.10 + 0.0017 × t ¹ , Class AA (1/3 Class B) 0.30 + 0.005 × t ¹ , Class B

Environmental influences

Ambient temperature range for the head	Basic type 902815/10... : -30 to +90 °C Basic types 902815/20... and 902815/21... : -30 to +85 °C
Storage temperature range	-30 to +90 °C
Climatic conditions	according to IEC 68-2-30 (rel. humidity ≤ 95 % with condensation)
Vibration strength	according to IEC 68-2-6 (according to GL characteristic)

Technical data (transmitter)

Input

Shortest span	10 K
Sampling rate	1 measurement per second
Input filter	1st order digital filter; filter constant adjustable from 0 to 125 s

Measuring circuit monitoring

Underrange	linear fall off to 3.8 mA (according to NAMUR recommendation 43)
OVERRANGE	linear rise up to 20.5 mA (according to NAMUR recommendation 43)
Probe short-circuit, probe or lead break	≤ 3.6 mA or ≥ 21.0 mA (configurable)
Current limiting for probe short-circuit or probe break	≤ 25 mA

Output

Output signal	proportional DC current 4 to 20 mA or 20 to 4 mA
Transfer characteristic	linear with temperature
Maximum burden resistance (R_B)	$R_B = (U_b - 8 \text{ V}) / 23 \text{ mA}$, max. 600 Ω
Burden error	≤ ±0.02 %/100 Ω ²
Settling time after temperature change	≤ 5 s
Settling time after switch-on or reset	≤ 5 s
Measuring accuracy for electronics	0.1 °C or 0.08 % ³

Electrical data

Voltage supply (U_b)	8 to 35 V DC (pin 1 = +, pin 3 = -), only for operation in SELV or PELV circuits according to EN 50178
Reverse polarity protection	yes
Voltage supply error	≤ ± 0.01 % per V deviation from 24 V ²

Environmental influences

Ambient temperature error	≤ ±(15 ppm/°C × (range end + 200) + 50 ppm/°C × set range) × Δv Δv = deviation of ambient temperature from the reference temperature
Calibration/reference conditions	24 V DC at 25 °C ± 5 °C (77 °F ± 9 °F)
Electromagnetic compatibility (EMC) - interference emission - interference immunity	EN 61326 Class B industrial requirements

¹ |t| is the numerical value of the temperature in °C, disregarding the sign.

² % details refer to the end of range value 20 mA.

³ % details refer to the measuring span that has been set, the larger value applies.

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 Internet: www.jumo.net

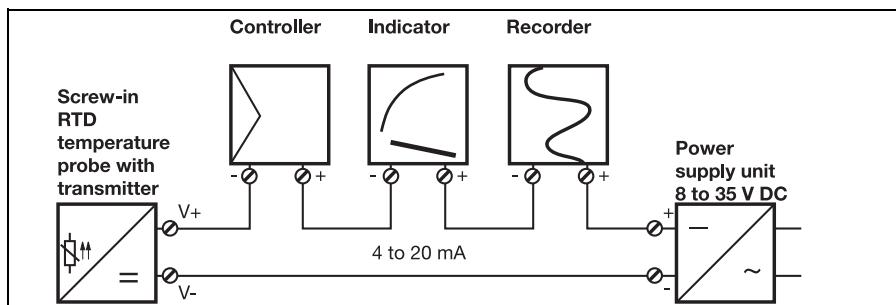
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 E-mail: sales@jumo.co.uk
 Internet: www.jumo.co.uk

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 1-800-554-JUMO
 Fax: 315-697-5867
 E-mail: info@jumo.us
 Internet: www.jumo.us

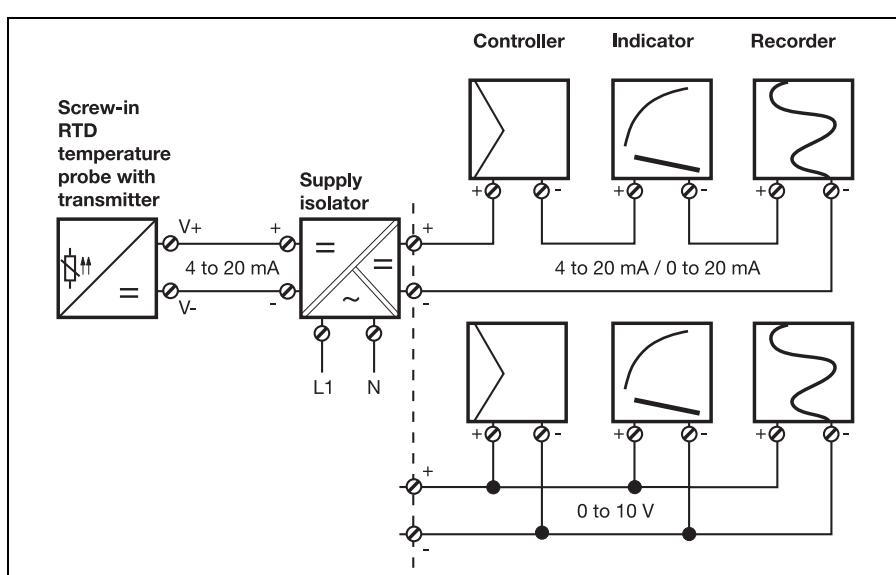


Connection example with transmitter

Connection example with power supply unit

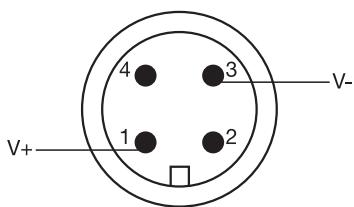
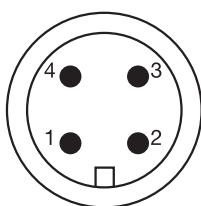


Connection example with supply isolator



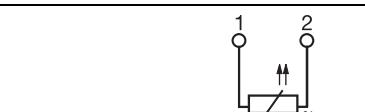
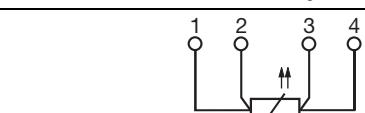
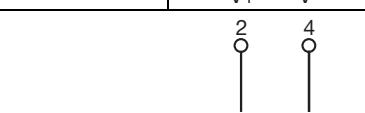
Connection diagram

Machine connector M12 x 1, 4-pole
 according to IEC 60947-5-2



Caution:

do not make any connection to pins 2 and 4!

Electrical connection	Terminal assignments
Basic type 902815/10... without transmitter	
Screw-in RTD temperature probe in 2-wire circuit	
Screw-in RTD temperature probe in 4-wire circuit	
Basic type 902815/20... and 902815/21... with programmable transmitter	
Voltage supply 8 to 35 V DC	
Current output 4 to 20 mA	
Setup communication via special configuration cable (only for configuration – not for continuous operation)	

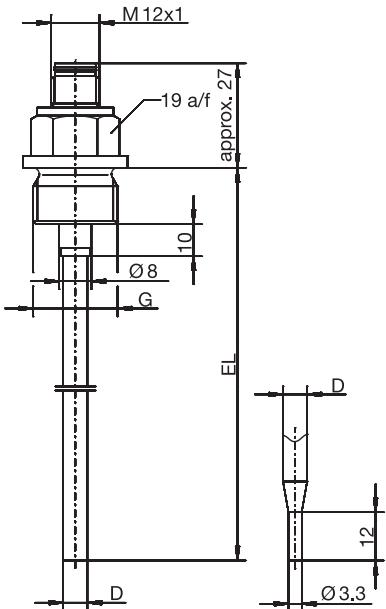
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 Fax: +49 661 6003-607
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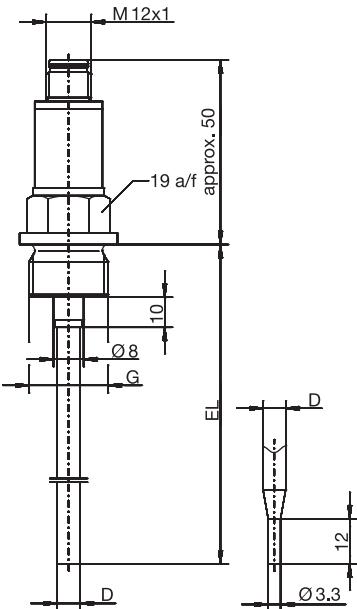
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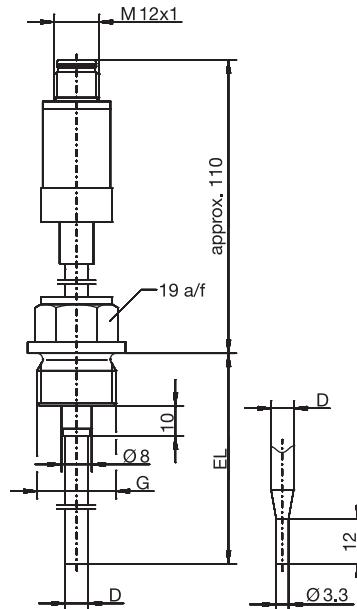
Dimensions – basic types



Basic type 902815/10...
without transmitter

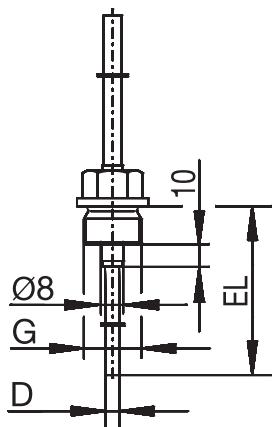


Basic type 902815/20...
with transmitter



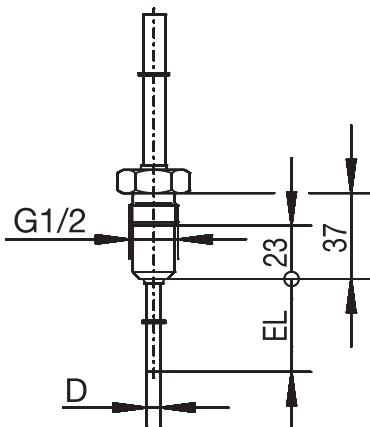
Basic type 902815/21...
with transmitter and extension

Dimensions of process connections (PA)



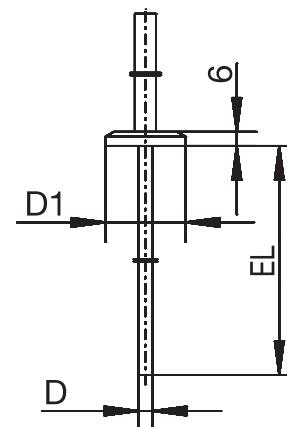
PA	G
103	3/8
104	1/2

Screw fitting



PA	
380	

Screw fitting
with CIP-compliant conical seal



PA	DN	D1	PA	DN	D1
-	-	Ø 25	613	40/1.5"	Ø 50.5
611	10/20	Ø 34	616	50/2"	Ø 64
613	25/1"	Ø 50.5	617	2.5"	Ø 77.5

Clamping nipple according to DIN 32676
(clamp)

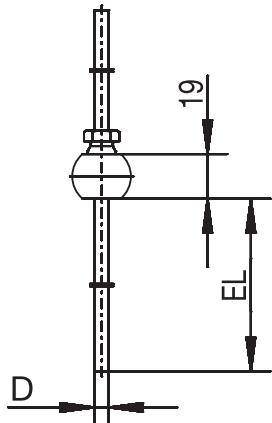
JUMO GmbH & Co. KG
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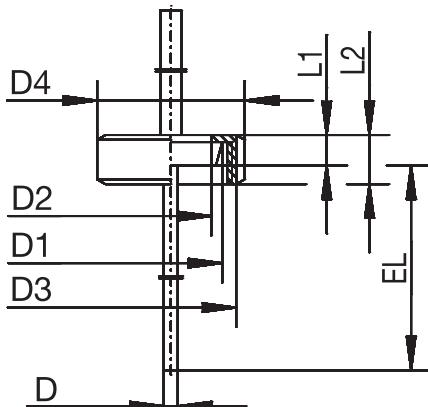


Dimensions of process connections (PA)

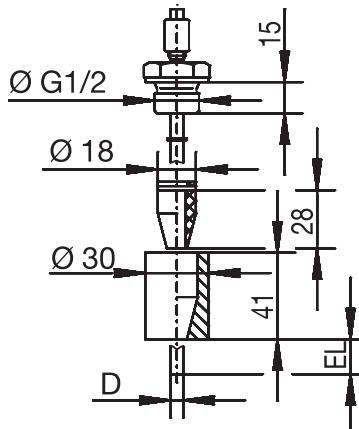


PA	DN	D1	D2	D3	D4	L1	L2
681							

Ball weld-in socket
with clamping thread

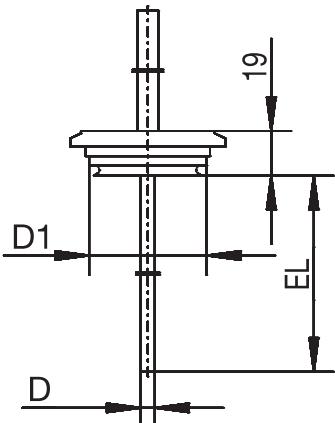


Taper nipple
with cap nut according to DIN 11851
(milk pipe screw fitting)



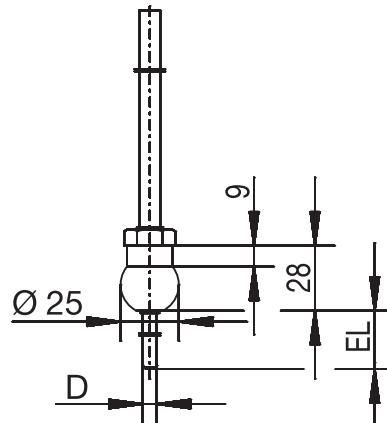
PA	DN	D1	D2	D3	D4	L1	L2
682							

Weld-in socket
with CIP-compliant conical seal



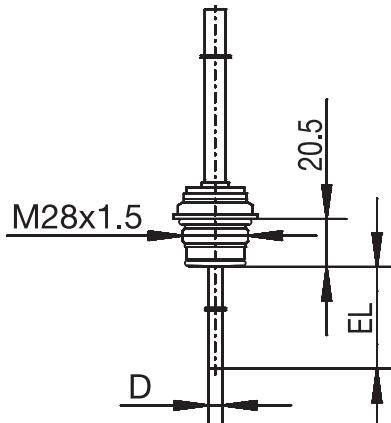
PA	DN	D1
684	15/10	Ø 31
685	32/25	Ø 50
686	50/40	Ø 68

Varivent connection



PA	DN	D1
681		

Ball weld-in socket



Varivent	Clamp	Aseptic	Weld-in socket
DN 25/32	DN 25/32/40	DN 40	Ø 55 mm
DN 40-125	DN 50	DN 50	-
-	NKS DN 40	-	

JUMO PEKA PA 997
Process connection adapter,
see data sheet 409711

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Order details: JUMO Dtrans T100 Screw-in RTD temperature probe with/without transmitter
 - Product with an integrated transmitter is not intended for export to the USA! -

(1) Basic type	
902815/10	Screw-in RTD temperature probe without transmitter, connection: M12 x 1 machine connector, parts in contact with the medium: electrolytically polished; surface roughness Ra ≤ 0.8 µm
902815/20	Screw-in RTD temperature probe with programmable transmitter ² , connection: M12 x 1 machine connector, parts in contact with the medium: electrolytically polished; surface roughness Ra ≤ 0.8 µm
902815/21	Screw-in RTD temperature probe with programmable transmitter ² , connection: M12 x 1 machine connector, high-temperature version with extension, parts in contact with the medium: electrolytically polished; surface roughness Ra ≤ 0.8 µm
(2) Operating temperature in °C	
x x	370 -50 to +150 °C (max. transmitter temperature 85 °C)
x x	380 -50 to +200 °C
x x	386 -50 to +260 °C (max. transmitter temperature 85 °C)
(3) Measuring insert	
x x x	1003 1 x Pt100 in 2-wire circuit
x x x	1005 1 x Pt1000 in 2-wire circuit
x x x	1011 1 x Pt100 in 4-wire circuit
x x x	1013 1 x Pt1000 in 4-wire circuit
(4) Tolerance class according to EN 60751	
x x x	1 Class B (standard at basic type 902815/10...)
x x x	2 Class A (standard at basic type 902815/2....)
x x x	3 Class AA (1/3 Class B)
(5) Sheath diameter D in mm	
x x x	6 Ø 6 mm
(6) Fitting length EL in mm (EL 50 to 500)	
x x x	50 50 mm
x x x	100 100 mm
x x x	150 150 mm
x x x	200 200 mm
x x x	... specify in plain text (50 mm steps)
(7) Process connection (PA)	
x x x	000 none (please note at basic type 902815/2.... max. transmitter temperature 85 °C)
x x x	103 G 3/8 (3/8" pipe) thread
x x x	104 G 1/2 (1/2" pipe) thread
x x x	380 G 1/2 (1/2" pipe) thread with CIP-compliant conical seal, with EHEDG certification
x x x	601 taper nipple with ring nut DN 10 according to DIN 11851 (milk pipe screw fitting)
x x x	604 taper nipple with ring nut DN 25 according to DIN 11851 (milk pipe screw fitting)
x x x	605 taper nipple with ring nut DN 32 according to DIN 11851 (milk pipe screw fitting)
x x x	611 clamping nipple DN 10/20 according to DIN 32676
x x x	613 clamping nipple DN 25/40 (1"/1.5") according to DIN 32676
x x x	616 clamping nipple DN 50 (2") according to DIN 32676
x x x	617 clamping nipple 2.5" similar according to DIN 32676
x x x	681 ball weld-in socket with clamping thread
x x x	682 weld-in socket with CIP-compliant conical seal
x x x	684 Varivent connection DN 15/10, with EHEDG certification
x x x	685 Varivent connection DN 32/25, with EHEDG certification
x x x	686 Varivent connection DN 50/40, with EHEDG certification
x x x	840 ball weld-in pocket (material 316 Ti)
x x x	997 JUMO PEKA with EHEDG certification
(8) Sheath material	
x x x	24 stainless steel 316 L (Mat. Ref. 1.4404/1.4435)
x x x	26 stainless steel 316 Ti (Mat. Ref. 1.4571) (on request)
(9) Extra codes	
x x x	000 none
x x x	100 customer-specific factory setting (please specify parameters in plain text)
x x x	310 sheath stepped down from Ø 6 mm dia. to Ø 3.3 mm
x x x	810 weld-in socket (only for process connection 380)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
------------	------------	------------	------------	------------	------------	------------	------------	------------

Order code

Order example

902815/20 - 370 - 1013 - 2 - 6 - 100 - 104 - 24 / 000

¹ List extra codes in sequence, separated by commas.

² Specify measuring range in plain text.

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Setup program

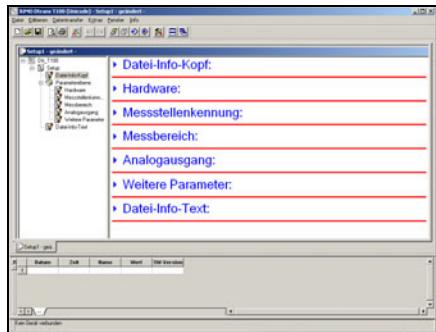
The setup program is used for configuring the programmable 2-wire transmitter with the aid of a PC.

This requires:

- configuration cable with plug connector, socket and Western plug
 - PVC connecting cable, length 2 meters
 - PC interface with USB/TTL converter and USB cable
- (see accessories for programmable 2-wire transmitter)

In order to configure the 2-wire transmitter, it has to be connected to a voltage supply.

If no power supply or supply isolator is available, it can also be configured by using a 9 V battery as a power source.



Configurable parameters

Measuring point ID

- TAG number

Range configurable in °C/°F

- Offset
- Range start
- Range end

Analog output

- Reversed output
- Signal for probe break/short-circuit

Additional parameters

- Filter time constant
- Unit

Hardware and software requirements

The following hardware and software requirements have to be met for installing and operating the software:

Minimum configuration

- Intel Pentium¹ III
- Microsoft Windows² 2000 or XP
- 256 MB main memory
- CD-ROM drive
- mouse
- free USB interface
- 120 MB available on hard disk

Recommended configuration

- Intel Pentium 4
- Windows XP
- 512 MB main memory

Notes for Windows 2000 or XP

If more than one user is administered by the computer, then the user who is logged in must be the one who will subsequently be working with the program.

The user must have administrator rights during the installation of the software. After installation, the rights can be restricted again. If this is disregarded, it is not possible to ensure a correct and complete installation.

Standard accessories

1 Operating Instructions B 902815.0

Accessories for programmable 2-wire transmitter

Setup program on CD-ROM, multilingual

Configuration cable, 4-pole with plug and socket M12 x 1 and Western connector RJ-45

PVC connecting cable, 4-pole with M12 x 1 socket, length 2000 mm

PC interface with USB/TTL converter and USB cable

Power supply units: 1- way and 4-way (data sheet 707500)

Isolating amplifier and supply isolator for electrical isolation of standard signals and voltage supply for 2-wire transmitter (data sheet 707510)

Part No.

90/00485016
 90/00484692
 90/00404585
 70/00456352

-

Stock versions

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Part No.								
902815/10	-	380	-	1011	-	1	-	6	-	100	-	104	-	24	/	000	90/00508463
902815/10	-	380	-	1011	-	3	-	6	-	50	-	104	-	24	/	000	90/00516241
902815/10	-	380	-	1011	-	3	-	6	-	150	-	104	-	24	/	000	90/00516245
902815/10	-	380	-	1011	-	3	-	6	-	200	-	104	-	24	/	000	90/00516246
902815/20	-	370	-	1013	-	2	-	6	-	50	-	104	-	24	/	000	90/00508279
902815/20	-	370	-	1013	-	2	-	6	-	100	-	380	-	24	/	000	90/00513650
902815/20	-	370	-	1013	-	2	-	6	-	100	-	104	-	24	/	000	90/00491506
902815/20	-	370	-	1013	-	2	-	6	-	150	-	000	-	24	/	000	90/00506630
902815/20	-	370	-	1013	-	2	-	6	-	200	-	104	-	24	/	000	90/00503113

¹ Intel and Pentium are registered trademarks of Intel Corporation.

² Microsoft and Windows are registered trademarks of Microsoft Corporation.

Sealing Accessories

0605 Fluoropolymer Tape

	FKM	 0605 12 12	kg 0.012
Can be used for temperatures from - 250°C to +260°C. Chemically inert and resistant to gases, acids, solvents, hydrocarbons, oils, alkalines, steam etc. Non-toxic, waterproof, self-lubricating. In accordance with CFR21. Can be used on all materials. Used to facilitate the preparation of leak-free threaded joints. Supplied on a reel, length = 12 m; width = 12.7 mm; thickness 0.08 mm.			

0602 Captive Sealing Washer

C		G1	G2	K	kg
M5x0.8	0602 29 93 15	5.2	7.8	1.5	0.001
G1/8	0602 23 10 20	10.3	14	2	0.001
G1/4	0602 23 11 20	13.7	17.5	2	0.001
G3/8	0602 23 12 20	17.2	21	2	0.001
G1/2	0602 23 13 20	21.5	25.5	2.5	0.002
G3/4	0602 27 32 20	27	32	2.5	0.001
G1	0602 30 60 20	33.8	39	3	0.001

Maximum allowable working pressure: 20 bar

0139 Bi-Material Captive Sealing Washer

C		G	K	K1	kg
G1/8	0139 10 00	14	1	1.7	0.001
G1/4	0139 13 00	17	1	1.7	0.001
G3/8	0139 17 00	22	1.2	2.1	0.001
G1/2	0139 21 00	26	1.6	2.5	0.002
G3/4	0139 27 00	32	1.5	2.5	0.003
G1	0139 34 00	39.6	1.7	2.6	0.003

Maximum allowable working pressure: 250 bar

Technical characteristics of captive seals 0602

Tightening torque



	M5x0.8	G1/8	G1/4	G3/8	G1/2	G3/4	G1
Min. Torque in daN.m	0.06	0.08	0.3	0.5	1	1.2	1.9
Max. Torque daN.m	0.16	0.8	1.2	3	3.5	6	9

DATENBLATT

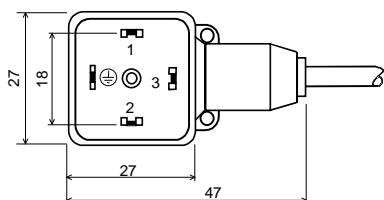
A U F B A U

- GEHÄUSE: MSUD 18mm, sw
 - ABMESSUNGEN: siehe Skizze
 - ANSCHLUßART: 1,5 m PVC-JZ Kabel 4x0,75 mm², grau
Zulassungen: UL, CSA
 - LITZENAUFBAU: 24x0,2 mm
 - BEFESTIGUNG: aufgesteckt, verschraubt
 - ANZEIGE: ohne Bauteile
-

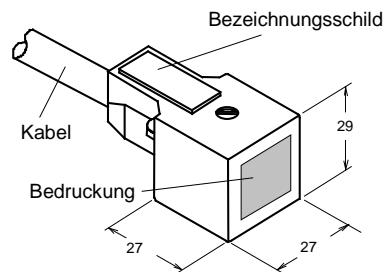
E L E K T R I S C H E D A T E N

- ANSCHLUSSPG.: 0...230 V AC/DC
- BETRIEBSSTROM: 10 A

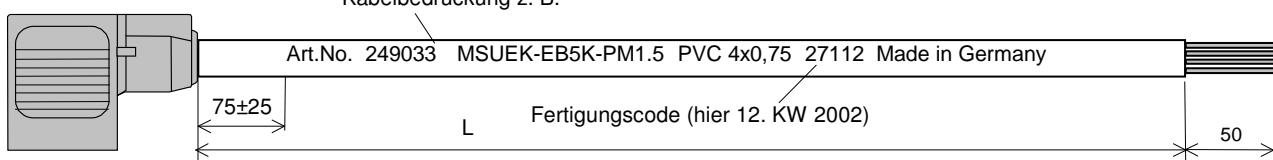
DIN-Kontaktierung 0°



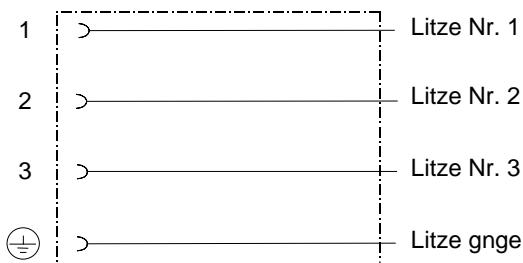
TECHNISCHE SKIZZE



Kabelbedruckung z. B.



STROMLAUFPLAN



BESONDERHEITEN:

- Jeder Stecker wird mit Flachkopfschraube, Bezeichnungsschild und integrierter Dichtung bestückt.

Gilt ebenfalls für Artikelnummer:

249034

MSUEK-EB5K-PM3.0 Mantellänge 3,0 m

249035

MSUEK-EB5K-PM5.0 Mantellänge 5,0 m

249036

MSUEK-EB5K-PM10.0 Mantellänge 10,0 m

					Datum	Name
				Bear.	11.03.02	Ma
				Gepr.	06.05.04	HR
				Ges.	06.05.04	LS
b	Verguss	06.05.04	Ma			
Idx.	Änderung	Datum	Nam.			
a	Erstausgabe	11.03.02	Ma	19.08.04	249033db.doc	

MURR
ELEKTRONIK

**Datenblatt
Stromlaufplan
Bedruckungsanweisung**

MSUEK-EB5K-PM1.5

Art. No.: 249033

Blatt
1 von 1

ERROR: undefined
OFFENDING COMMAND: get

STACK:

/quit
-dictionary-
-mark-

ERROR: undefined
OFFENDING COMMAND: get

STACK:

/quit
-dictionary-
-mark-

Brass

blueglobe®

Brass nickel plated, metric connection thread as per EN 50262
Type of protection: IP 68, up to 15 bar over the whole sealing range

Sealing insert

Material	Temperature range	Colour
TPE	-40 °C up to +130 °C	blue (RAL 5012)

Gland body

Material	Execution
brass	galv. nickel plated



Fig. 1

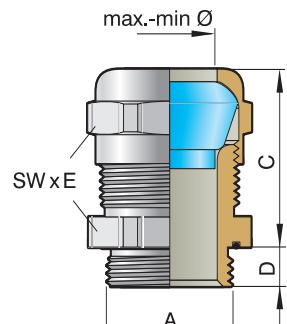


Fig. 2 with inlet

Connection thread/length		Article No.	Sealing range	Sealing range without inlet	C	Spanner width SW x E
A	D		max./min. Ø mm	max./min. Ø mm	mm	mm
M12x1,5	5	bg212 ms	8 – 2	8 – 5	21	17x18,9
M16x1,5	6	bg216 ms	11 – 4	11 – 7	25	20x22,2
M20x1,5	6,5	bg220 ms	14 – 5	14 – 9	29	24x26,5
M25x1,5	7,5	bg225 ms	20 – 11	20 – 15,5	29	30x33
M32x1,5	8	bg232 ms	25 – 15	25 – 20	32	36x39,5
M40x1,5	8	bg240 ms	32 – 20	32 – 26	35	45x48
M50x1,5	10	bg250 ms	42 – 31	42 – 35	35	57x61
M63x1,5	10	bg263 ms	54 – 41	54 – 46	38	68x74
M85x2		bg285 ms	in preparation			

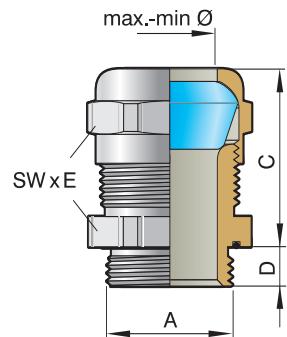


Fig. 3 without inlet

Connection thread/length		Article No.	Sealing range	Sealing range without inlet	C	Spanner width SW x E
A	D		max./min. Ø mm	max./min. Ø mm	mm	mm
M12x1,5	15	bg812 ms	8 – 2	8 – 5	21	17x18,9
M16x1,5	15	bg816 ms	11 – 4	11 – 7	25	20x22,2
M20x1,5	15	bg820 ms	14 – 5	14 – 9	29	24x26,5
M25x1,5	15	bg825 ms	20 – 11	20 – 15,5	29	30x33
M32x1,5	15	bg832 ms	25 – 15	25 – 20	32	36x39,5
M40x1,5	15	bg840 ms	32 – 20	32 – 26	35	45x48
M50x1,5	15	bg850 ms	42 – 31	42 – 35	35	57x61
M63x1,5	15	bg863 ms	54 – 41	54 – 46	38	68x74

(blueglobe reaches/exceeds partly the test requirements of EN 50262, as per Pflitsch laboratory)

Tightening torques for brass and stainless steel pressure screws and double nipple

Thread	M12	M16	M20	M25	M32	M40	M50	M63
Nm	5	8	10	15	15	20	30	35

Test value as per EN50262 x1,5

**estell e c en
r c ellen l ten**

Polypropylen
innen glatt

**Order codes
for clamp-halves:**
Polypropylene **RAPR**
inside smooth RAPG

Polyamid 6
innen glatt

**Polyamide 6
inside smooth RANR**
RANG

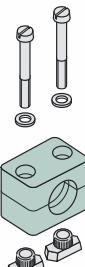
Vollgummi
Aluminium

G
**Rubber
Aluminium RAVG***
RAAR
Replace standard abbreviation
RAPR in column "Order codes"
as required.

Bei Bedarf Standardkurz-
zeichen RAPR in der Spalte
„Bestellzeichen“ austauschen.

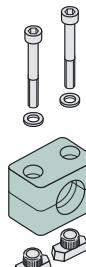
2 Schellenhäften mit
Tragschienen-Muttern,
Schlitzschrauben und
U-Scheiben

2 clamp halves with rail nuts,
slot head bolts and bushes



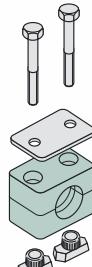
2 Schellenhäften mit
Tragschienen-Muttern,
Innensechskantschrauben
und U-Scheiben

2 clamp halves with
rail nuts, socket head
bolts and bushes



2 Schellenhäften mit
Tragschienen-Muttern,
Deckplatte und Sechs-
kantschrauben

2 clamp halves with
rail nuts, cover plate
and hex. head bolts



Schellengröße Clamp size	Rohr-AD mm O.D. mm	Rohr-NW Tube NB	Rohr-AD Zoll Inch O.D.	Bestellzeichen Order Codes	Bestellzeichen Order Codes	Bestellzeichen Order Codes
6 6,4 8 9,5 10 12			1/4 5/16 3/8	RAPR 9-006 RAPR 9-006,4 RAPR 9-008 RAPR 9-009,5 RAPR 9-010 RAPR 9-012	RAPR 10-006 RAPR 10-006,4 RAPR 10-008 RAPR 10-009,5 RAPR 10-010 RAPR 10-012	RAPR 12-006 RAPR 12-006,4 RAPR 12-008 RAPR 12-009,5 RAPR 12-010 RAPR 12-012
6 6,4 8 9,5 10 12			1/4 5/16 3/8	RAPR 9-106 RAPR 9-106,4 RAPR 9-108 RAPR 9-109,5 RAPR 9-110 RAPR 9-112	RAPR 10-106 RAPR 10-106,4 RAPR 10-108 RAPR 10-109,5 RAPR 10-110 RAPR 10-112	RAPR 12-106 RAPR 12-106,4 RAPR 12-108 RAPR 12-109,5 RAPR 12-110 RAPR 12-112
12,7 13,5 14 15 16 17,2 18		G 1/4	1/2	RAPR 9-212,7 RAPR 9-213,5 RAPR 9-214 RAPR 9-215 RAPR 9-216 RAPR 9-217,2 RAPR 9-218	RAPR 10-212,7 RAPR 10-213,5 RAPR 10-214 RAPR 10-215 RAPR 10-216 RAPR 10-217,2 RAPR 10-218	RAPR 12-212,7 RAPR 12-213,5 RAPR 12-214 RAPR 12-215 RAPR 12-216 RAPR 12-217,2 RAPR 12-218
19 20 21,3 22 23 25		G 1/2	3/4	RAPR 9-319 RAPR 9-320 RAPR 9-321,3 RAPR 9-322 RAPR 9-323 RAPR 9-325	RAPR 10-319 RAPR 10-320 RAPR 10-321,3 RAPR 10-322 RAPR 10-323 RAPR 10-325	RAPR 12-319 RAPR 12-320 RAPR 12-321,3 RAPR 12-322 RAPR 12-323 RAPR 12-325
26,9 28 30		G 3/4		RAPR 9-426,9 RAPR 9-428 RAPR 9-430	RAPR 10-426,9 RAPR 10-428 RAPR 10-430	RAPR 12-426,9 RAPR 12-428 RAPR 12-430
32 33,7 35 38 40 42		G 1	1 1/4	RAPR 9-532 RAPR 9-533,7 RAPR 9-535 RAPR 9-538 RAPR 9-540 RAPR 9-542	RAPR 10-532 RAPR 10-533,7 RAPR 10-535 RAPR 10-538 RAPR 10-540 RAPR 10-542	RAPR 12-532 RAPR 12-533,7 RAPR 12-535 RAPR 12-538 RAPR 12-540 RAPR 12-542
44,5 45 48 50 50,8 52 55 57		G 1 1/2	1 3/4 2 2 1/4	RAPR 9-644,5 RAPR 9-645 RAPR 9-648 RAPR 9-650 RAPR 9-650,8 RAPR 9-652 RAPR 9-655 RAPR 9-657	RAPR 10-644,5 RAPR 10-645 RAPR 10-648 RAPR 10-650 RAPR 10-650,8 RAPR 10-652 RAPR 10-655 RAPR 10-657	RAPR 12-644,5 RAPR 12-645 RAPR 12-648 RAPR 12-650 RAPR 12-650,8 RAPR 12-652 RAPR 12-655 RAPR 12-657

Werden andere Kombinationen benötigt, so bestellen Sie diese bitte in Einzelteilen (Bestellzeichen hierfür siehe Seiten 8 – 12). Die Auslieferung erfolgt unmontiert in Einzelteilen.
"Schellen der Größe 0 werden in Abweichung von den Abbildungen nur mit einer Schraube befestigt."

If different combinations are required, we would be obliged if they could be ordered as separate components (Please refer to individual components, pages 8 – 12).
Delivery in unassembled individual components. "Contrary to illustration size 0 clamps are secured by only one screw."

*Nur mit Deckplatte, Sechskantschrauben und Sicherungsscheiben *Only with cover plate, hexagon screws and locking washers

**estell e c en
r c ellen l ten**

Polypropylen
innen glatt

**Order codes
for clamp-halves:**
Polypropylene **RAPR**
inside smooth **RAPG**

Polyamid 6
innen glatt

Polyamide 6
inside smooth **RANR**
RANG

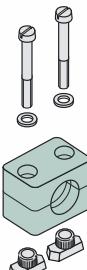
Vollgummi
Aluminium

Rubber
Aluminium **RAVG***
RAAR
Replace standard abbreviation
RAPR in column "Order codes"
as required.

Bei Bedarf Standardkurz-
zeichen RAPR in der Spalte
„Bestellzeichen“ austauschen.

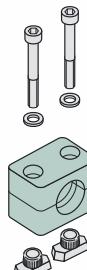
2 Schellenhäften mit
Tragschienen-Muttern,
Schlitzschrauben und
U-Scheiben

2 clamp halves with rail nuts,
slot head bolts and bushes



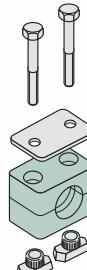
2 Schellenhäften mit
Tragschienen-Muttern,
Innensechskantschrauben
und U-Scheiben

2 clamp halves with
rail nuts, socket head
bolts and bushes



2 Schellenhäften mit
Tragschienen-Muttern,
Deckplatte und Sechs-
kantschrauben

2 clamp halves with
rail nuts, cover plate
and hex. head bolts



Schellengröße Clamp size	Rohr-AD mm O.D. mm	Rohr-NW Tube NB	Rohr-AD Zoll Inch O.D.	Bestellzeichen Order Codes	Bestellzeichen Order Codes	Bestellzeichen Order Codes
6 6,4 8 9,5 10 12			1/4 5/16 3/8	RAPR 9-006 RAPR 9-006,4 RAPR 9-008 RAPR 9-009,5 RAPR 9-010 RAPR 9-012	RAPR 10-006 RAPR 10-006,4 RAPR 10-008 RAPR 10-009,5 RAPR 10-010 RAPR 10-012	RAPR 12-006 RAPR 12-006,4 RAPR 12-008 RAPR 12-009,5 RAPR 12-010 RAPR 12-012
6 6,4 8 9,5 10 12			1/4 5/16 3/8	RAPR 9-106 RAPR 9-106,4 RAPR 9-108 RAPR 9-109,5 RAPR 9-110 RAPR 9-112	RAPR 10-106 RAPR 10-106,4 RAPR 10-108 RAPR 10-109,5 RAPR 10-110 RAPR 10-112	RAPR 12-106 RAPR 12-106,4 RAPR 12-108 RAPR 12-109,5 RAPR 12-110 RAPR 12-112
12,7 13,5 14 15 16 17,2 18		G 1/4	1/2	RAPR 9-212,7 RAPR 9-213,5 RAPR 9-214 RAPR 9-215 RAPR 9-216 RAPR 9-217,2 RAPR 9-218	RAPR 10-212,7 RAPR 10-213,5 RAPR 10-214 RAPR 10-215 RAPR 10-216 RAPR 10-217,2 RAPR 10-218	RAPR 12-212,7 RAPR 12-213,5 RAPR 12-214 RAPR 12-215 RAPR 12-216 RAPR 12-217,2 RAPR 12-218
19 20 21,3 22 23 25		G 1/2	3/4	RAPR 9-319 RAPR 9-320 RAPR 9-321,3 RAPR 9-322 RAPR 9-323 RAPR 9-325	RAPR 10-319 RAPR 10-320 RAPR 10-321,3 RAPR 10-322 RAPR 10-323 RAPR 10-325	RAPR 12-319 RAPR 12-320 RAPR 12-321,3 RAPR 12-322 RAPR 12-323 RAPR 12-325
26,9 28 30		G 3/4		RAPR 9-426,9 RAPR 9-428 RAPR 9-430	RAPR 10-426,9 RAPR 10-428 RAPR 10-430	RAPR 12-426,9 RAPR 12-428 RAPR 12-430
32 33,7 35 38 40 42		G 1	1 1/4	RAPR 9-532 RAPR 9-533,7 RAPR 9-535 RAPR 9-538 RAPR 9-540 RAPR 9-542	RAPR 10-532 RAPR 10-533,7 RAPR 10-535 RAPR 10-538 RAPR 10-540 RAPR 10-542	RAPR 12-532 RAPR 12-533,7 RAPR 12-535 RAPR 12-538 RAPR 12-540 RAPR 12-542
44,5 45 48 50 50,8 52 55 57		G 1 1/2	1 3/4 2 2 1/4	RAPR 9-644,5 RAPR 9-645 RAPR 9-648 RAPR 9-650 RAPR 9-650,8 RAPR 9-652 RAPR 9-655 RAPR 9-657	RAPR 10-644,5 RAPR 10-645 RAPR 10-648 RAPR 10-650 RAPR 10-650,8 RAPR 10-652 RAPR 10-655 RAPR 10-657	RAPR 12-644,5 RAPR 12-645 RAPR 12-648 RAPR 12-650 RAPR 12-650,8 RAPR 12-652 RAPR 12-655 RAPR 12-657

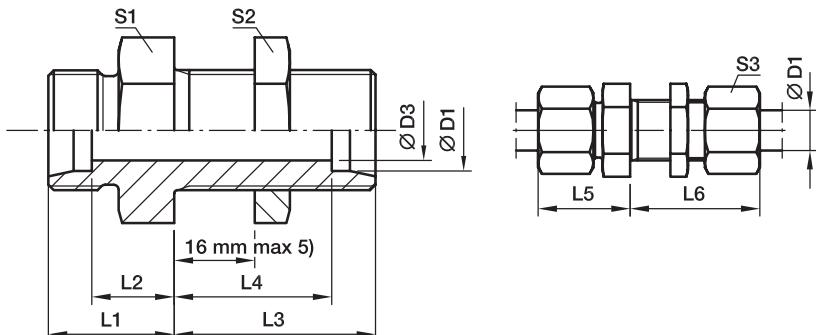
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"Schellen der Größe 0 werden in Abweichung von den Abbildungen nur mit einer Schraube befestigt."

If different combinations are required, we would be obliged if they could be ordered as separate components (Please refer to individual components, pages 8 – 12).
Delivery in unassembled individual components. "Contrary to illustration size 0 clamps are secured by only one screw."

*Nur mit Deckplatte, Sechskantschrauben und Sicherungsscheiben *Only with cover plate, hexagon screws and locking washers

SV Bulkhead union

EO 24° cone end



Series	D1	D3	L1	L2	L3	L4	L5	L6	S1	S2	S3	Weight g/1 piece	Order code*	PN (bar) ¹⁾		
	CF													CF	71	MS
L ³⁾	06	4	14	7.0	34	27.0	22	42	17	17	14	39	SV06LOMD	500	315	200
	08	6	15	8.0	34	27.0	23	42	19	19	17	50	SV08LOMD	500	315	200
	10	8	17	10.0	35	28.0	25	43	22	22	19	67	SV10LOMD	500	315	200
	12	10	17	10.0	36	29.0	25	44	24	24	22	78	SV12LOMD	400	315	200
	15	12	19	12.0	38	31.0	27	46	27	30	27	128	SV15LOMD	400	315	200
	18	15	21	13.5	40	32.5	30	49	32	36	32	198	SV18LOMD	400	315	200
	22	19	24	16.5	42	34.5	33	51	36	41	36	254	SV22LOMD	250	160	100
	28	24	26	18.5	43	35.5	35	52	41	46	41	335	SV28LOMD	250	160	100
	35	30	29	18.5	47	36.5	40	58	50	55	50	546	SV35LOMD	250	160	160
	42	36	30	19.0	47	36.0	42	59	60	65	60	758	SV42LOMD	250	160	160
S ⁴⁾	06	4	19	12.0	36	29.0	27	44	19	19	17	65	SV06SOMD	800	630	400
	08	5	20	13.0	36	29.0	28	44	22	22	19	87	SV08SOMD	800	630	400
	10	7	22	14.5	37	29.5	31	46	24	24	22	112	SV10SOMD	800	630	400
	12	8	22	14.5	38	30.5	31	47	27	27	24	141	SV12SOMD	630	630	400
	14	10	25	17.0	40	32.0	35	50	30	30	27	180	SV14SOMD	630	630	
	16	12	25	16.5	40	31.5	35	50	32	32	30	201	SV16SOMD	630	400	250
	20	16	28	17.5	44	33.5	39	55	41	41	36	462	SV20SOMD	420	400	250
	25	20	32	20.0	47	35.0	44	59	46	46	46	492	SV25SOMD	420	400	250
	30	25	35	21.5	51	37.5	48	64	50	50	50	631	SV30SOMD	420	400	250
	38	32	38	22.0	53	37.0	53	68	65	65	60	1083	SV38SOMD	420	315	

1) Pressure shown = item deliverable

3) L = light series; 4) S = heavy series

5) Bulkhead thickness min.

06–18 L and 06–16 S = 3 mm

22–42 L and 20–38 S = 4 mm

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

Delivery without nut and ring. Information on ordering complete fittings see page I7.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes		
Material	Suffix surface and material	Example
Steel, zinc plated, Cr(VI)-free	CF	SV16SOMDCF
Stainless Steel	71	SV16SOMD71
Brass	MS	SV16SOMDMS

Steel grades – standard manufacturing program

Designation Sandvik	Chemical composition (nominal), %					Standards* UNS	ASTM TP	EN Steel number
	C	Cr	Ni	Mo	Others			
Austenitic stainless steels (prefix standard THT, TST, TST-E or THE)								
3R12	≤0.030	18.5	10	–	–	S30403/S30400	304L/304	1.4306/1.4301
Sandvik 3R60	≤0.030	17.5	13	2.6	–	S31603/S31600	316L/316	1.4435/1.4436
3R65	≤0.030	17	11.5	2.1	–	S31603/S31600	316L/316	1.4404/1.4401
6R35	0.05	17.5	10.5	–	Ti	S32100	321	1.4541
5R75	0.05	17	12	2.1	Ti	S31635	316Ti	1.4571
3R19	≤0.030	18.5	9	–	N	S30453	304LN	1.4311
3R64	≤0.030	18.5	14.5	3.1	–	S31703	317L	(1.4438)*
3R68	≤0.030	17	13	4.1	N	–	–	1.4439
6R44 ¹⁰⁾	0.06	17.5	10	–	Nb	S34700	347	1.4550
3R60 U.G.	≤0.020	17.5	14	2.6	–	S31603	316L	1.4435
Duplex stainless steels (prefix standard THT, TST, TST-E or THE)								
Sandvik SAF 2205	≤0.030	22	5	3.2	N	S31803/S32205	–	1.4462
Sandvik SAF 2507	≤0.030	25	7	4	N	S32750	–	1.4410
Sandvik SAF 2707 HD	≤0.030	27	6.5	4.8	N, Co	S32707	–	–
Sandvik SAF 2304	≤0.030	22.5	4.5	–	N	S32304	–	1.4362
3RE60	≤0.030	18.5	4.5	2.6	Si, N	S31500	–	1.4424
High-alloy austenitic stainless steels and nickel alloys (prefix standard THT, TST, TST-E or THE)								
2RK65	≤0.020	20	25	4.5	Cu	N08904	–	1.4539
Sandvik Sanicro 28	≤0.020	27	31	3.5	Cu	N08028	–	1.4563
2RE10	≤0.015	24.5	20	–	–	S31002	–	1.4335
2RE69	≤0.020	25	22	2.1	N	S31050	–	1.4466
254 SMO	≤0.020	20	18	6.1	N, Cu	S31254	–	1.4547
Sandvik Sanicro 30	≤0.030	20	32	–	Ti, Al	N08800	Alloy 800	1.4558
Sandvik Sanicro 41	≤0.030	20	38.5	2.6	Cu, Ti	N08825	Alloy 825	–
Sandvik Sanicro 69	0.02	30	60	–	Fe	N06690	Alloy 690	2.4642**
High temperature grades (prefix standard THR)								
2C48	0.09	23.5	–	–	N	S44600	446-2	–
4C54	≤0.20	26.5	–	–	N	S44600	446-1	1.4749**
5R10	0.04	18.5	9.5	–	–	S30400/S30409	304/304H	1.4301/1.4948
6R35	0.05	17.5	10.5	–	Ti	S32109	321H	1.4940
6LR62	0.05	17	11.5	2.1	–	S31600/S31609	316, 316H	1.4401
6R44 ¹⁰⁾	0.06	17.5	10	–	Nb	S34709	347H	1.4912
8R41	0.06	16.5	13	–	Nb	–	–	1.4961
7RE10	0.06	24.5	21	–	–	S31008/S31009	310S, 310H	1.4845**
253 MA	0.08	21	11	–	Si, N, Ce	S30815	–	1.4835**
353 MA	0.07	25	35	–	Si, N, Ce	S35315	–	1.4854**
Sandvik Sanicro 31HT	0.07	20.5	30.5	–	Ti, Al	N08811/N08810	–	1.4959
8RE18	0.07	22.5	14	–	–	S30908/S30909	309S, 309H	1.4833**
Esshete 1250	0.1	15	9.5	1.0	Mn, V, Nb, B	S21500	–	1.4982
Sandvik Sanicro 61	0.03	23	60	–	Al	N06601	–	–
Sandvik Sanicro 70	≤0.05	16.5	72.5	–	Fe	N06600	Alloy 600	–
Special grades for machining (prefix standard THB or MBR)								
Sanmac 304/304L	≤0.030	18.5	9	–	–	S30400/S30403	304/304L	1.4301/1.4307
Sanmac 316/316L	≤0.030	16.5	11	2.1	–	S31600/S31603	316/316L	1.4401/1.4404
Sanmac 4435	≤0.030	17.5	12.5	2.6	–	S31600/S31603	316/316L	1.4436/1.4435
Sanmac 4571	0.03	17	12.5	2.1	Ti	S31635	316Ti	1.4571
Sanmac SAF 2205	≤0.030	21.5	4.5	3.2	N	S31803	–	1.4462
10RE51	0.04	26	5	1.3	–	S32900	–	1.4460
Sanmac 4305	≤0.035	17.5	9	–	S	S30300	303	1.4305

¹⁾ Valid for SEW 470²⁾ DIN 17459

* In brackets, nearest equivalent steel grade.

³⁾ Sanicro 31H⁴⁾ NFA 49-317 with min 45% can be fulfilled.

** Not applicable for tube and pipe. Only for information.

⁵⁾ Valid for SEW 400.⁶⁾ 1.4465 can be certified.

Hydraulic tubing

Order example:

THT-3R12-10-1

● = Size in stock

○ = In stock on customer order.

Other sizes are available on mill
order quantity.**THT**

Outside diameter	Wall thickness	Weight	Sandvik 3R12	Sandvik 3R60	Sandvik 6R35	Sandvik 5R75
mm	mm	kg/m	TP 304/304L EN 1.4306	TP 316/316L EN 1.4435	TP 321 EN 1.4541	TP 316Ti EN 1.4571
3	0.5	0.031		●		
	0.7	0.040		●		
6	1.0	0.125	●	●	○	●
	1.5	0.169		●		●
8	1.0	0.175	●	●	○	●
	1.5	0.244	●	●		●
	2.0	0.300	●	●	○	
10	1.0	0.225	●	●	○	●
	1.5	0.319	●	●	○	●
	2.0	0.400	●	●	○	●
12	1.0	0.275	●	●	○	●
	1.5	0.394	●	●	○	●
	2.0	0.500	●	●	○	●
14	1.0	0.325	●	●		
	1.5	0.467				●
	2.0	0.600	●	●		●
15	1.0	0.350	●	●		
	1.5	0.506	●	●		●
	2.0	0.650	●	●		●
16	1.0	0.375	●	●		
	1.5	0.544	●	●		●
	2.0	0.700	●	●	○	●
	2.5	0.844		●	○	●
18	1.0	0.425	●	●		
	1.5	0.619	●	●	○	●
	2.0	0.800	●	●	○	●
	2.5	0.966				●
20	1.5	0.694	●	●		
	2.0	0.900	●	●		●
	2.5	1.094		●	○	●
	3.0	1.271			○	●
	4.0	1.600		●		
22	1.5	0.769	●	●	○	●
	2.0	1.000	●	●	○	●
25	1.5	0.877	●			
	2.0	1.150	●	●		●
	2.5	1.407	●	●		●
	3.0	1.650	●	●		●
28	1.5	0.994	●	●	○	●
	2.0	1.300	●	●	○	●
	2.5	1.594	●	●		
30	2.5	1.719		●		
	3.0	2.025	●	●		●
	4.0	2.601		●		●

Cont.

Order example:

THT-3R12-10-1

- = Size in stock
- = In stock on customer order.
- Other sizes are available on mill order quantity.

THT

Outside diameter mm	Wall thickness mm	Weight kg/m	Sandvik 3R12 TP 304/304L EN 1.4306	Sandvik 3R60 TP 316/316L EN 1.4435	Sandvik 6R35 TP 321 EN 1.4541	Sandvik 5R75 TP 316Ti EN 1.4571
35	2.0	1.650	●	●		
	2.5	2.022	●			●
	3.0	2.401	●	●		
38	2.0	1.800	●	●		
	3.0	2.626	●	●		●
	4.0	3.401		●		●
	5.0	4.126		●		●
42	2.0	2.000		●		
	3.0	2.926	●	●		●
50	5.0	5.627		●		

Tolerances**Sandvik 3R12, Sandvik 3R60, Sandvik 6R35 and Sandvik 5R75****OD 6–42 mm, DIN 2391/EN 10305-1**

OD mm	Tolerances OD, mm	Wall thickness %
6–30	+/-0.08	+/-10
32–40	+/-0.15	+/-10
42	+/-0.20	+/-10

Sandvik 3R60**OD <6 mm, tolerances according to ASTM A632**

OD mm	Tolerances OD, mm	Wall thickness %
<6–4.76	+0.10/-0	+/-10
<4.76–2.38	+0.08/-0	+/-10
<2.38	+0.05/-0	+/-10

Sandvik 3R60 with OD above 42 mm

OD +/-0.50%, but min +/-0.1 mm (D4), WT +/-10%,
but min +/-0.2 mm (T3).**Standards****Sandvik 3R12 (TP 304/304L) and****Sandvik 3R60 (TP 316/316L)**

DIN 17458, TC1

NFA 49-117

ASTM A213-AW (average wall)

ASTM A269

NACE MR0175/ISO 15156

PED 97/23/EC

EN 10216-5 TC1

OD<6 mm acc to A632

Sandvik 6R35 (TP 321) and**Sandvik 5R75 (TP 316Ti)**

DIN 17458, TC1

PED 97/23/EC

EN 10216-5 TC1

Steel grades – standard manufacturing program

Designation Sandvik	Chemical composition (nominal), %					Standards* UNS	ASTM TP	EN Steel number
	C	Cr	Ni	Mo	Others			
Austenitic stainless steels (prefix standard THT, TST, TST-E or THE)								
3R12	≤0.030	18.5	10	–	–	S30403/S30400	304L/304	1.4306/1.4301
Sandvik 3R60	≤0.030	17.5	13	2.6	–	S31603/S31600	316L/316	1.4435/1.4436
3R65	≤0.030	17	11.5	2.1	–	S31603/S31600	316L/316	1.4404/1.4401
6R35	0.05	17.5	10.5	–	Ti	S32100	321	1.4541
5R75	0.05	17	12	2.1	Ti	S31635	316Ti	1.4571
3R19	≤0.030	18.5	9	–	N	S30453	304LN	1.4311
3R64	≤0.030	18.5	14.5	3.1	–	S31703	317L	(1.4438)*
3R68	≤0.030	17	13	4.1	N	–	–	1.4439
6R44 ¹⁰⁾	0.06	17.5	10	–	Nb	S34700	347	1.4550
3R60 U.G.	≤0.020	17.5	14	2.6	–	S31603	316L	1.4435
Duplex stainless steels (prefix standard THT, TST, TST-E or THE)								
Sandvik SAF 2205	≤0.030	22	5	3.2	N	S31803/S32205	–	1.4462
Sandvik SAF 2507	≤0.030	25	7	4	N	S32750	–	1.4410
Sandvik SAF 2707 HD	≤0.030	27	6.5	4.8	N, Co	S32707	–	–
Sandvik SAF 2304	≤0.030	22.5	4.5	–	N	S32304	–	1.4362
3RE60	≤0.030	18.5	4.5	2.6	Si, N	S31500	–	1.4424
High-alloy austenitic stainless steels and nickel alloys (prefix standard THT, TST, TST-E or THE)								
2RK65	≤0.020	20	25	4.5	Cu	N08904	–	1.4539
Sandvik Sanicro 28	≤0.020	27	31	3.5	Cu	N08028	–	1.4563
2RE10	≤0.015	24.5	20	–	–	S31002	–	1.4335
2RE69	≤0.020	25	22	2.1	N	S31050	–	1.4466
254 SMO	≤0.020	20	18	6.1	N, Cu	S31254	–	1.4547
Sandvik Sanicro 30	≤0.030	20	32	–	Ti, Al	N08800	Alloy 800	1.4558
Sandvik Sanicro 41	≤0.030	20	38.5	2.6	Cu, Ti	N08825	Alloy 825	–
Sandvik Sanicro 69	0.02	30	60	–	Fe	N06690	Alloy 690	2.4642**
High temperature grades (prefix standard THR)								
2C48	0.09	23.5	–	–	N	S44600	446-2	–
4C54	≤0.20	26.5	–	–	N	S44600	446-1	1.4749**
5R10	0.04	18.5	9.5	–	–	S30400/S30409	304/304H	1.4301/1.4948
6R35	0.05	17.5	10.5	–	Ti	S32109	321H	1.4940
6LR62	0.05	17	11.5	2.1	–	S31600/S31609	316, 316H	1.4401
6R44 ¹⁰⁾	0.06	17.5	10	–	Nb	S34709	347H	1.4912
8R41	0.06	16.5	13	–	Nb	–	–	1.4961
7RE10	0.06	24.5	21	–	–	S31008/S31009	310S, 310H	1.4845**
253 MA	0.08	21	11	–	Si, N, Ce	S30815	–	1.4835**
353 MA	0.07	25	35	–	Si, N, Ce	S35315	–	1.4854**
Sandvik Sanicro 31HT	0.07	20.5	30.5	–	Ti, Al	N08811/N08810	–	1.4959
8RE18	0.07	22.5	14	–	–	S30908/S30909	309S, 309H	1.4833**
Esshete 1250	0.1	15	9.5	1.0	Mn, V, Nb, B	S21500	–	1.4982
Sandvik Sanicro 61	0.03	23	60	–	Al	N06601	–	–
Sandvik Sanicro 70	≤0.05	16.5	72.5	–	Fe	N06600	Alloy 600	–
Special grades for machining (prefix standard THB or MBR)								
Sanmac 304/304L	≤0.030	18.5	9	–	–	S30400/S30403	304/304L	1.4301/1.4307
Sanmac 316/316L	≤0.030	16.5	11	2.1	–	S31600/S31603	316/316L	1.4401/1.4404
Sanmac 4435	≤0.030	17.5	12.5	2.6	–	S31600/S31603	316/316L	1.4436/1.4435
Sanmac 4571	0.03	17	12.5	2.1	Ti	S31635	316Ti	1.4571
Sanmac SAF 2205	≤0.030	21.5	4.5	3.2	N	S31803	–	1.4462
10RE51	0.04	26	5	1.3	–	S32900	–	1.4460
Sanmac 4305	≤0.035	17.5	9	–	S	S30300	303	1.4305

¹⁾ Valid for SEW 470²⁾ DIN 17459

* In brackets, nearest equivalent steel grade.

³⁾ Sanicro 31H⁴⁾ NFA 49-317 with min 45% can be fulfilled.

** Not applicable for tube and pipe. Only for information.

⁵⁾ Valid for SEW 400.⁶⁾ 1.4465 can be certified.

Hydraulic tubing

Order example:

THT-3R12-10-1

● = Size in stock

○ = In stock on customer order.

Other sizes are available on mill order quantity.

THT

Outside diameter mm	Wall thickness mm	Weight kg/m	Sandvik 3R12	Sandvik 3R60	Sandvik 6R35	Sandvik 5R75
			TP 304/304L EN 1.4306	TP 316/316L EN 1.4435	TP 321 EN 1.4541	TP 316Ti EN 1.4571
3	0.5	0.031		●		
	0.7	0.040		●		
6	1.0	0.125	●	●	○	●
	1.5	0.169		●		●
8	1.0	0.175	●	●	○	●
	1.5	0.244	●	●		●
	2.0	0.300	●	●	○	
10	1.0	0.225	●	●	○	●
	1.5	0.319	●	●	○	●
	2.0	0.400	●	●	○	●
12	1.0	0.275	●	●	○	●
	1.5	0.394	●	●	○	●
	2.0	0.500	●	●	○	●
14	1.0	0.325	●	●		
	1.5	0.467				●
	2.0	0.600	●	●		●
15	1.0	0.350	●	●		
	1.5	0.506	●	●		●
	2.0	0.650	●	●		●
16	1.0	0.375	●	●		
	1.5	0.544	●	●		●
	2.0	0.700	●	●	○	●
	2.5	0.844		●	○	●
18	1.0	0.425	●	●		
	1.5	0.619	●	●	○	●
	2.0	0.800	●	●	○	●
	2.5	0.966				●
20	1.5	0.694	●	●		
	2.0	0.900	●	●		●
	2.5	1.094		●	○	●
	3.0	1.271			○	●
	4.0	1.600		●		
22	1.5	0.769	●	●	○	●
	2.0	1.000	●	●	○	●
25	1.5	0.877	●			
	2.0	1.150	●	●		
	2.5	1.407	●	●		
	3.0	1.650	●	●		
28	1.5	0.994	●	●	○	●
	2.0	1.300	●	●	○	●
	2.5	1.594	●	●		
30	2.5	1.719		●		
	3.0	2.025	●	●		
	4.0	2.601		●		

Cont.

Order example:

THT-3R12-10-1

- = Size in stock
- = In stock on customer order.
- Other sizes are available on mill order quantity.

THT

Outside diameter mm	Wall thickness mm	Weight kg/m	Sandvik 3R12 TP 304/304L EN 1.4306	Sandvik 3R60 TP 316/316L EN 1.4435	Sandvik 6R35 TP 321 EN 1.4541	Sandvik 5R75 TP 316Ti EN 1.4571
35	2.0	1.650	●	●		
	2.5	2.022	●			●
	3.0	2.401	●	●		
38	2.0	1.800	●	●		
	3.0	2.626	●	●		●
	4.0	3.401		●		●
	5.0	4.126		●		●
42	2.0	2.000		●		
	3.0	2.926	●	●		●
50	5.0	5.627		●		

Tolerances**Sandvik 3R12, Sandvik 3R60, Sandvik 6R35 and Sandvik 5R75****OD 6–42 mm, DIN 2391/EN 10305-1**

OD mm	Tolerances OD, mm	Wall thickness %
6–30	+/-0.08	+/-10
32–40	+/-0.15	+/-10
42	+/-0.20	+/-10

Sandvik 3R60**OD <6 mm, tolerances according to ASTM A632**

OD mm	Tolerances OD, mm	Wall thickness %
<6–4.76	+0.10/-0	+/-10
<4.76–2.38	+0.08/-0	+/-10
<2.38	+0.05/-0	+/-10

Sandvik 3R60 with OD above 42 mm

OD +/-0.50%, but min +/-0.1 mm (D4), WT +/-10%,
but min +/-0.2 mm (T3).**Standards****Sandvik 3R12 (TP 304/304L) and****Sandvik 3R60 (TP 316/316L)**

DIN 17458, TC1

NFA 49-117

ASTM A213-AW (average wall)

ASTM A269

NACE MR0175/ISO 15156

PED 97/23/EC

EN 10216-5 TC1

OD<6 mm acc to A632

Sandvik 6R35 (TP 321) and**Sandvik 5R75 (TP 316Ti)**

DIN 17458, TC1

PED 97/23/EC

EN 10216-5 TC1

ELECTRONIC PRESSURE SWITCH

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for measurement of pressure and temperature. The Electronic Pressure Switch EPN-S is based on the well-proven EPN transmitter family. It stands for reliable accuracy over a wide temperature range and excellent long-term stability even in harshest environments in the shipbuilding and railway industry. The switchpoint is factory set or can be programmed on site using Trafag's Sensor Communicator SC.



Applications

- Shipbuilding
- Engine manufacturing
- Railways
- Machine tools
- Hydraulics
- HVAC

Features

- Rugged design for harsh environments
- Wide temperature range
- Excellent long-term stability
- Very compact design
- Switchpoint factory set or programmable on site with Trafag's Sensor Communicator SC

Technical Data			
Measuring principle	Thin film on steel	Accuracy @ 25°C typ.	±0.5% FS typ. (Switchpoint)
Measuring range	0 ... 2.5 to 0 ... 600 bar 0 ... 30 to 0 ... 7500 psi	Media temperature	-40°C ... 125°C
Output signal	Transistor (open source)	Approval	GL

Ordering information/type code

				8320 . XX . XX . XX . XX . XX . XX
Measuring range¹⁾	Pressure measurement range [bar]	Over pressure [bar]	Burst pressure [bar]	
0 ... 2.5	5	100	75	
0 ... 4	8	100	76	
0 ... 6	12	100	77	
0 ... 10	20	200	78	
0 ... 16	32	200	79	
0 ... 25	50	300	80	
0 ... 40	80	300	81	
0 ... 60	120	500	82	
0 ... 100	200	500	83	
0 ... 160	320	1000	85	
0 ... 250	500	1000	74	
0 ... 400	800	1500	84	
0 ... 600	1000	2000	86	
Sensor	Relative pressure			23
Pressure connection	G1/4" male (O-Ring) 1/4"NPT male G1/2" male (DIN3852-A) ²⁾ M14x1.5 male (DIN3852-A) ²⁾ 1/2"NPT male ²⁾			17 30 21 22 51
Electrical connection	Male electrical plug: EN 175301-803-A (DIN43650-A) Cable with shield: Material: FDR 25 (Raychem) 4 x 0.5mm ² (Cable lenght see "Accessories")			04 78
Output	1 Transistor out: Switchpoint "ON": ... (bar)/Switchpoint "OFF": ... (bar)/Delay time: Standard 5 (ms) /... (ma) Range: 5...10000 (ms)			T1
Accessories	Pressure peak damping element ø 0.4 mm Pressure peak damping element ø 1.0 mm Female electrical connector EN 175301-803-A (DIN43650-A), NBR, -40...90°C Railways execution (500 VAC/DC), with shielded cable only Higher operating temperature: -40...+125°C Cable length 1.5 m Cable length 3.0 m Cable length 5.0 m			44 40 58 11 67 1M 3M 5M

¹⁾ Customized pressure ranges upon request²⁾ Please ask us
 **Programming device Sensor Communicator SC**
Ordering No.

- Sensor Communicator SC: F88030
- Programming cable with connector EN 175301-803A: F88049

Manual see

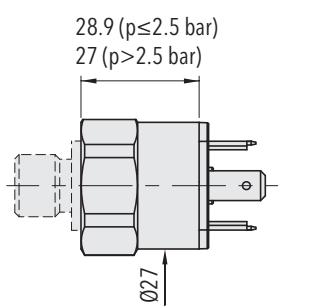
- Sensor Communicator SC: www.trafag.com/H73699



Specifications		
Accuracy	Accuracy @ 25°C typ.	±0.5% FS typ. (Switchpoint)
	Temperature dependence switching point	Switchpoint @ +25°C: ±0.5% FS typ. Switchpoint @ -25 ... +85°C: ±1.0% FS typ. Switchpoint @ -40 ... +125°C: ±1.3% FS typ. (Accessory 67: higher operating temperature -40 ... 125°C)
	Long term stability 1 year typ.	≤ ± 0.15 % FS typ.
Electrical Data	Supply voltage	24(9 ... 32)VDC
	Current consumption	≤ 15 mA
	Short-circuit strength	integrated
	Inverse-polarity protection	integrated
	Resistance of insulation	>10 MΩ, 250 VDC ≥ >10 MΩ, 500 VDC
	Dielectric strength	250 VAC, 50 Hz ≥ 500 VAC, 50 Hz
Environmental Conditions	Media temperature	-40°C ... +125°C
	Ambient temperature	Standard: -25 ... +85°C Option (Ordering no. 67): -40 ... +125°C
	Protection	Electrical connection 04: IP65 (IP67) Electrical connection 78: IP69K
	Humidity	Max. 95% relative
	Vibration	15g (50...2000 Hz)
	Shock	50g/ 11 ms
EMC Protection	Emission	EN/IEC 61000-6-3
	Immunity	EN/IEC 61000-6-2
Mechanical Data	Sensor	1.4542 (AISI630)
	Housing / Pressure connection	1.4542 (AISI630) / 1.4301 (AISI304)
	Sealing	FKM 70 Sh
	Male electrical plug	See ordering information
	Weight	~ 85...110 g
	Mounting torque	25 Nm

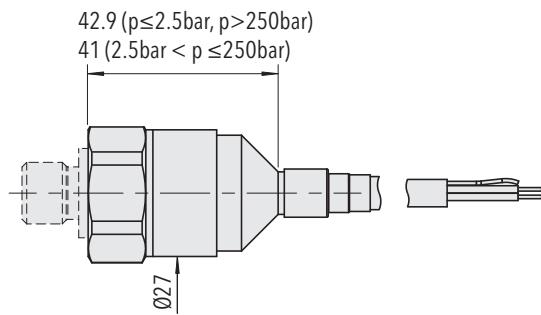
Output	
Output signal	1 transistor (open source)
Switchpoint setting	Factory set or programmable on site with Trafag's Sensor Communicator SC
Adjustment range	0...100% FS
Switching hysteresis	≥ 1% FS
Switching current	≤ 0.5 A @ -40...+85°C ≤ 0.4 A @ +85...+125°C (only with accessory 67: Higher operating temperature -40...125°C)
Switch resistance	≤ 3Ω
Delay time	Standard adjustment: 5ms Adjustable with Trafag Sensor Communicator (only electrical connection 04): 5ms...10s

Dimensions



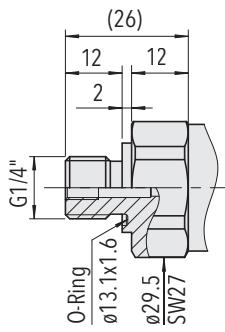
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Switchpoint factory set or
programmable on site with Trafag
Sensor Communicator SC

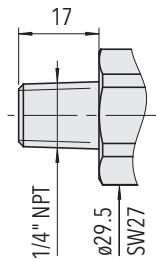


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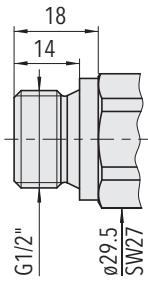
Switchpoint factory set



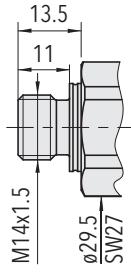
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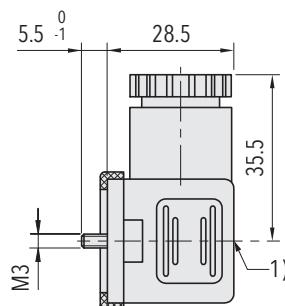
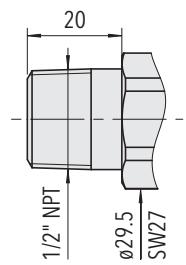
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8320.XX.XX 21.XX.XX.XX



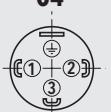
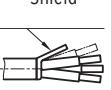
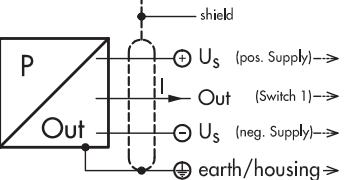
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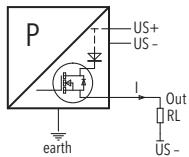
8320.XX.XX51.XX.XX.XX

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Electrical Connection

Protection / electrical connection									
IP65 (IP67)	IP69K								
Industrial standard EN175301-803A	Cable **)								
04 	78 								
Output signal  8320.xx.xxxx.xx.T1	<table> <tr> <td>1</td><td>brown</td></tr> <tr> <td>2</td><td>blue</td></tr> <tr> <td>3</td><td>black</td></tr> <tr> <td>\oplus</td><td>yellow / green</td></tr> </table>	1	brown	2	blue	3	black	\oplus	yellow / green
1	brown								
2	blue								
3	black								
\oplus	yellow / green								

**) Ventilation via cable end

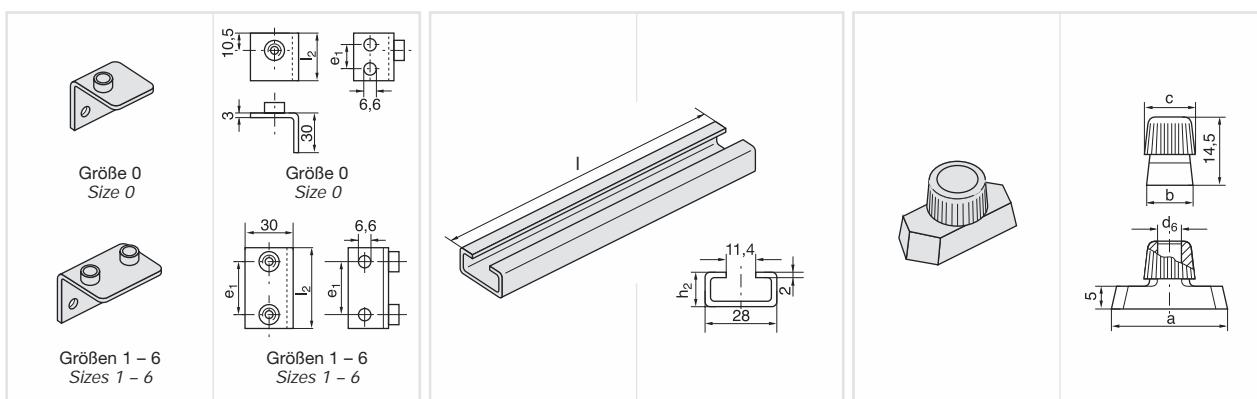


Connection of loads to switch contacts

Additional information		
Documents	Data sheet	www.trafag.com/H72333
	Instructions	www.trafag.com/H73333
	Flyer	www.trafag.com/H70652

Komlett Pro r mm siehe Seiten 16 bis 20

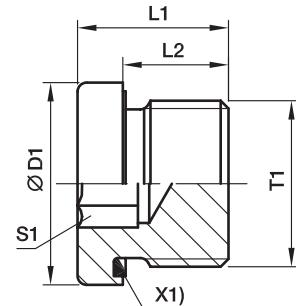
Complete range please refer to pages 16 to 20



Schellengröße Clamp size	Winkelanschweißplatte Weld plate, angled P	Winkelanschweißplatte Weld plate, angled P	Tragschiene Mounting rail	Tragschiene Mounting rail	Tragschienen-Mutter Rail nut M	Tragschienen-Mutter Rail nut M			
		e_1	l_1	l	h_2	a	b	c	d_6
	APW-A 0	14	30						
	APW-A 1	20	36						
	APW-A 2	26	42						
	APW-A 3	33	50	TS 11-A/B 1	1 m	11			
	APW-A 4	40	59	TS 11-A/B 2	2 m	11			
	APW-A 5	52	72	TS 14-A/B 1	1 m	14			
	APW-A 6	66	88	TS 14-A/B 2	2 m	14	TM-A (TM-B1)	25,4 10,4 12 M 6	
				TS 30-A/B 1	1 m	30			
				TS 30-A/B 2	2 m	30			

VSTI M/R-ED Blanking plug for ports

Male metric thread – ED-seal (ISO 9974)
 Male BSPP thread – ED-seal (ISO 1179)



X1) Eolastic-sealing ED

Male metric parallel thread T1	Male stud BSP thread T1	D1	L1	L2	S1	Weight g/1 piece	Order code*	Order code*	PN (bar) ¹⁾	CF	71
M 10x1.0	G 1/8 A	14.0	12.3	8	5	8	VSTI10X1ED	VSTI1/8ED	400	400	
M 12x1.5		17.0	17.3	12	6	14	VSTI12X1.5ED		400	400	
M 14x1.5		19.0	17.3	12	6	20	VSTI14X1.5ED		400	400	
M 16x1.5		22.0	17.3	12	8	25	VSTI16X1.5ED		400	400	
M 18x1.5		24.0	17.3	12	8	32	VSTI18X1.5ED		400	400	
M 20x1.5		26.0	19.3	14	10	42	VSTI20X1.5ED		400	400	
M 22x1.5	G 1/2 A	27.0	19.3	14	10	51	VSTI22X1.5ED	VSTI1/2ED	400	400	
M 26x1.5		32.0	21.3	16	12	78	VSTI26X1.5ED		400	400	
M 27x2.0		32.0	21.3	16	12	79	VSTI27X2ED		400	400	
M 33x2.0		40.0	22.8	16	17	130	VSTI33X2ED		400	400	
M 42x2.0		50.0	22.8	16	22	198	VSTI42X2ED		315	315	
M 48x2.0		55.0	22.8	16	24	263	VSTI48X2ED		315	315	

¹⁾ Pressure shown = item deliverable

$$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$$

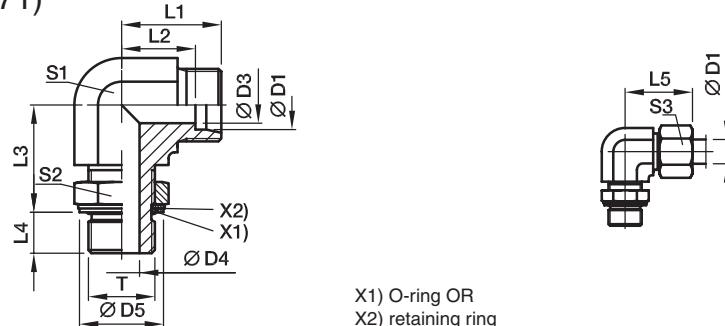
Information on ordering alternative sealing materials see page I7.

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	VSTI1/2EDCF	NBR
Stainless Steel	71	VSTI1/2ED71	VIT

WEE-R Adjustable locknut elbow

EO 24° cone end / Adjustable BSPP thread – O-ring + retaining ring (ISO 1179)
for ports with small or wide spot face;
differences in D5 in Stainless Steel are only for ports with wide spot face
(e.g. WEE16SRBOMD71)



Series	D1 	T	D3	D4	D5 ⁵⁾	D5 ⁶⁾	L1	L2	L3	L4	L5	S1	S2	S3	Weight g/1 piece	PN (bar) ¹⁾		
																Order code*	CF	71
LL ²⁾	04	G 1/8 A	3.0	4.5	15		15	11.3	20	7.1	21	11	14	10	27	WEE04LLROMD	250	
	06	G 1/8 A	4.5	4.5	15		15	11.3	20	7.1	21	11	14	12	27	WEE06LLROMD	250	
L ³⁾	06	G 1/8 A	4.0	4.5	15	15.0	21	14.0	19	7.0	29	14	14	14	40	WEE06LROND	315	315
	08	G 1/4 A	6.0	7.5	20	19.5	23	16.0	23	9.0	31	14	19	17	59	WEE08LROND	315	315
	10	G 1/4 A	8.0	7.5	20	19.5	24	17.0	25	9.0	32	19	19	19	82	WEE10LROND	315	315
	12	G 3/8 A	10.0	10.0	23	23.5	26	19.0	28	9.0	34	19	22	22	96	WEE12LROND	250	250
	15	G 1/2 A	12.0	12.5	28	28.5	28	21.0	30	13.0	36	22	27	27	149	WEE15LROND	250	250
	18	G 1/2 A	15.0	12.5	28	28.5	31	24.0	36	13.0	40	27	27	32	221	WEE18LROND	250	250
	22	G 3/4 A	19.0	15.5	33	34.5	35	28.0	36	13.0	44	30	36	36	310	WEE22LROND	160	160
	28	G 1 A	24.0	21.5	41	43.5	38	31.0	44	15.0	47	36	41	41	455	WEE28LROND	160	160
	35	G 1 1/4 A	30.0	27.5	51	52.5	48	38.0	50	15.0	59	50	50	50	1043	WEE35LROND	160	160
	42	G 1 1/2 A	36.0	33.0	56	60.0	49	38.0	52	15.0	61	50	55	60	994	WEE42LROND	160	160
S ⁴⁾	06	G 1/4 A	4.0	7.5	20	19.5	22	15.0	23	9.0	30	14	19	17	56	WEE06SROND	315	315
	08	G 1/4 A	5.0	7.5	20	19.5	24	17.0	27	9.0	32	19	19	19	88	WEE08SROND	315	315
	10	G 3/8 A	7.0	10.0	23	23.5	25	18.0	29	9.0	34	19	22	22	98	WEE10SROND	250	250
	12	G 3/8 A	8.0	10.0	23	23.5	29	22.0	29	9.0	38	22	22	24	128	WEE12SROND	250	250
	16	G 1/2 A	12.0	12.5	28	28.5	33	25.0	36	13.0	43	27	27	30	234	WEE16SROND	250	250
	20	G 3/4 A	16.0	15.5	33	34.5	38	28.0	39	12.0	49	30	36	36	344	WEE20SROND	250	250
	25	G 1 A	20.0	21.5	41	43.5	42	30.0	44	14.0	54	36	41	46	533	WEE25SROND	250	250
	30	G 1 1/4 A	25.0	27.5	51	52.5	49	36.0	49	15.0	62	50	50	50	1085	WEE30SROND	160	160
	38	G 1 1/2 A	32.0	33.0	56	60.0	50	34.0	55	15.0	65	50	55	60	1116	WEE38SROND	160	160

¹⁾ Pressure shown = item deliverable

²⁾ LL = very light series; ³⁾ L = light series; ⁴⁾ S = heavy series

$\frac{\text{PN (bar)}}{10} = \text{PN (MPa)}$

Delivery without nut and ring. Information on ordering complete fittings or alternative sealing materials see page 17.

⁵⁾ Steel; ⁶⁾ Stainless Steel

*Please add the **suffixes** below according to the material/surface required.

Order code suffixes			
Material	Suffix surface and material	Example	Standard sealing material (no additional suffix needed)
Steel, zinc plated, Cr(VI)-free	CF	WEE16SRONDGF	NBR
Stainless Steel	71	WEE16SRBOMD71	VIT