Program Book / Guidelines for
SKF Lubrication Systems – SKF Products

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Document Management Information

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List of Revisions

Revision Date	Version No.	Document Name	Revision	Paragraph Affected	Revised By
15-Sep-2009	vG1.0	CL-F-SKF	First Version Released	All	SKF
1-Nov-2010	vG1.1	CL-F-SKF	Filtration level changed to 10 micron from 25 on several part numbers. Added float switch.	3.4.1, 3.4.2, 3.5.3, 3.5.5, 3.6.3, 5.21, 5.22, 5.23, 5.24, 5.29, 5.32, 5.33, 5.34	Dan Schultz
16-Aug-2012	vG1.2	CL-F-SKF	Level switch technical clarification sating W1 is for NLGI 2 grease and W2 is for NLGI 000, 00, 0 and 1	5.19, 5.20	R. Reynolds
4-Feb-2013	vG2.0	CL-F-SKF	Added clear plastic reservoirs Added more oil+air/mist products Added new piston pump option Secondary 4mm plastic lines Quick connect fittings, 4mm	3.5.1, 3.5.2 3.3.4, 3.3.7 3.7.3 3.11, 5.42 3.10, 5.41	R. Reynolds
19-April-2013	vG2.1	CL-F-SKF	Added note “Engineering Approval Required” to Series 170 System	3.3.5	R. Reynolds
31-Jan-2014	vG2.2	CL-F-SKF	Changed part numbers to match drawings Fixed hydraulic symbol Updated hyperlink Removed circuit diagram, updated hyperlink Added country codes Added country codes, removed MF pump Removed MFE pump Added country codes Updated part numbers Updated part number, added hyperlink to brochure Added index section for oil streak sensors Added hyperlink to brochure Updated drawing Added drawing of SL-33 Updated drawings Changed to drawing of pump only Added drawings Removed MFE5-BW30-V59 Changed drawing Fixed drawing Changed drawing Updated drawing	3.1.1-3.1.4 3.2.4 3.2.5 3.2.6 3.3.2 3.4.1 3.5.2, 3.5.4 3.6.1, 3.6.2 3.7.3 3.8.4 3.8.5 3.9.1-3.9.3 5.2 5.13 5.18, 5.19 5.21 5.22 5.23 5.24-5.29 5.30 5.31 5.40, 5.41	S. Moninger

Revision Date	Version No.	Document Name	Revision	Paragraph Affected	Revised By
14-Sep-2017	vG2.3	CL-F-SKF	Updated voltage specifications Updated contacts Updated part numbers added link to brochure Added link to brochure Updated part number added link to brochure Updated part numbers Updated part numbers Updated part numbers Updated part numbers Added part numbers Updated part numbers Updated part numbers Updated drawings Removed drawings Updated drawing Removed drawings Updated drawing Updated drawing Removed drawing Updated drawing Removed drawings Updated drawings	1.2 2.1, 2.2 3.1.1 – 3.1.5 3.2.1 – 3.2.6 3.3.1, 3.3.2 3.4.1, 3.4.2 3.5.1 - 3.5.4 3.6.1 – 3.6.3 3.7.1 – 3.7.5 3.7.6 3.8.1, 3.8.2 3.9.1 4.1 – 4.3 5.1 – 5.12 5.13 5.14 – 5.16 5.17 5.18.1, 5.18.2 5.19 5.20 – 5.37 5.38, 5.39 5.40, 5.41	S. Moninger
18-Nov-2021	vG2.4	CL-F-SKF	Updated voltage specifications Updated contacts Removed +1FV voltage code Updated VCM part number Updated drawing Updated voltage codes, dimensions Updated drawing	1.2 2.1, 2.2 3.3 - 3.6 3.3.3 5.18,5.19,5.23 5.26 5.27, 5.28, 5.29, 5.31, 5.32	S. Moninger
19-Jul-2023	vG2.5	CL-F-SKF	Updated Contacts Removed KFB1, Added CLS Added P-866 drawing Removed KFB1 drawing, added CLS drawing	2 3.6.3 5.26 5.34	S. Moninger
30 January 2026	vG2.6	CL-F-SKF	Updated contacts Updated to universal piston detector Updated mixing valve part number Removed NVCM oil mist unit Updated part number to MFE5 Removed KFA1 Updated part number to PPU-UES-S2 Updated filter part number Updated piston detector drawing Updated section title to MV20*-1**-******** Removed NVCM drawing Updated drawing Updated filter drawing	2 3.2.6 3.3.1 3.3.3 3.4.1 3.7.2 3.7.6 3.9.1 5.16 5.17 5.19 5.30 5.47	S. Moninger

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1. General Information

1.1. Scope of Document

This delivery specification covers basic conditions for the design of lubrication systems for manufacturing equipment and production facilities. This standard promotes machine uptime, system commonality, operating functionality and reduced central lubrication equipment lifecycle costs.

1.2. Voltage Specifications for AC Motors

Voltage specifications may vary from plant to plant.

Consult the responsible GMPT Controls Engineer for the correct voltage in compliance with the project requirements.

NOTE: +1GP voltage code refers to motors: CE, UL, CSA certified

220/380 V, 50 Hz / 440 V, 60 Hz

+1GD voltage code refers to motors: CE, UL, CSA certified

230/400 V, 50 Hz / 460 V, 60 Hz

+1GQ voltage code refers to motors: CE, UL, CSA certified

240/415 V, 50 Hz / 480 V, 60 Hz

+1FW voltage code refers to single range motors: CCC certified

220 / 380 V, 50 Hz ±10%

Note on Part Numbers: Part numbers containing "**-GM0A**" are designed for Asia and use the +1FW CCC certified motor or the +1GQ CE, UL, CSA certified motor

Part numbers containing "**-GM0E**" are designed for Europe and use the +1GD CE, UL, CSA certified motor or the +1GQ CE, UL, CSA certified motor

Part numbers containing "**-GM0N**" are designed for the Americas and use the +1GD CE, UL, CSA certified motor or the +1GQ CE, UL, CSA certified motor

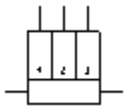
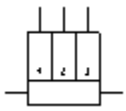
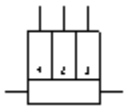
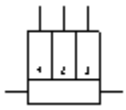
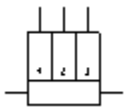
2. Service and Support Contacts

	North and South America		Europe
Company	SKF Lubrication Systems USA		SKF Lubrication Systems Germany GMBH
Address	5148 North Hanley Road St. Louis, MO 63134		Heinrich-Hertz-Strasse 2-8, 69190 Walldorf, Germany
Website	www.skf.com		www.skf.com
Local Support	Frank Casinelli	Sean Moninger	Peter Ohnmacht
Office	(314)-679-4200	(757)-951-0370	(+49) 9721564602
Mobile	(248) 982-7411		(+49) 1751855297
E-mail	frank.p.casinelli@skf.com	sean.moninger@skf.com	peter.ohnmacht@skf.com

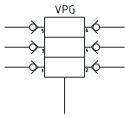
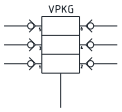
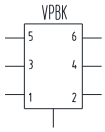
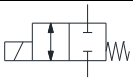
	Japan	Asia	United Kingdom
Company	SKF Japan LTD	SKF China Sales Co Ltd.	SKF (UK) Ltd
Address	4th floor, 3-19-6 Shin-Yokohama, Kohoku, Yokohama 222-0033, Japan	Shanghai – No Yuanqi Road Anting Town Jiading District, China	2 Canada Close, Marley Way Banbury OX16 2RT, United Kingdom
Website	www.skf.com	www.skf.com	www.skf.com
Local Support	Makoto Usami	Shuai Niu	Tim Veal
Office	(+81) 45 4782764		+44 1295 256611
Mobile		(+86) 13482571927	+44 7831 611096
E-mail	makoto.usami@skf.com	shuai.niu@skf.com	tim.veal@skf.com

3. Product Overview

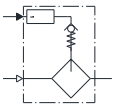
3.1. Piston Distributor System

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.1.1	Single line parallel systems, piston distributors for oil with quick connector		341 Series 340 Series 351 Series 350 Series 391 Series 390 Series		
3.1.2	Single line parallel systems, piston distributors for oil with solderless tube connector		341 Series 340 Series 351 Series 350 Series 391 Series 390 Series		
3.1.3	Single line parallel systems, piston distributors for fluid grease with quick connector		341 Series 340 Series 351 Series 350 Series 391 Series 390 Series		
3.1.4	Single line parallel systems, piston distributors for oil with solderless tube connector		341 Series 340 Series 351 Series 350 Series 391 Series 390 Series		
3.1.5	Single line injector system for fluid grease. Available with a single or up to five outlets Lincoln Centro-Matic Grease Injectors		85351-1 85351-2 85351-3 85351-4 85351-5	Output Adjustable from 0.016 cm^3 to 0.049 cm^3	

3.2. Progressive Feeder System

Section No.	Section Title	Symbol	SKF – No.	Remark		GM – No.
3.2.1	Progressive feeder section feeder		VPG-3-*** VPG-4-*** VPG-5-*** VPG-6-*** VPG-7-*** VPG-8-*** VPG-9-*** VPG-10***	Use VPG configurations only		
3.2.2	Progressive feeder section feeder		VPKG-3-*** VPKG-4-*** VPKG-5-*** VPKG-6-*** VPKG-7-*** VPKG-8-*** VPKG-9-*** VPKG-10***	Use VPKG configurations only		
3.2.3	Progressive feeder Block feeder For manual grease nipple systems only		VPBG-3-*** VPBG-4-*** VPBG-5-*** VPBG-6-*** VPBG-7-*** VPBG-8-*** VPBG-9-*** VPBG-10***	Use VPBG configurations only		
3.2.4	Zone control valve		VPG-VEN-GMO+924			
3.2.5	Blockage indicator for VPG	See drawing	VPG-UE16-2 VPG-UE32-2 VPG-UE50-3 VPG-UE63-2 VPG-UE80-2 VPG-UE100-2 VPG-UE100-3	16 bar 32 bar 50 bar 63 bar 80 bar 100 bar 100 bar		
3.2.6	Universal Piston Detector		24-0159-60**	VPG VPKG VPBG	3-wire DC PNP, 2-wire DC PNP/NPN	

3.3. Oil + Air Lubrication

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.3.1	Oil + Air mixing valves		MV201-100-*0000000 MV202-100-**000000 MV203-100-***00000 MV204-100-****0000 MV205-100-*****000 MV206-100-******00 MV207-100-*******0 MV208-100-********		
3.3.2	Oil + Air unit	See drawing	OLA**-GM0A+*** OLA**-GM0N+*** OLA**-GM0E+***	-GM0A units include motor with CCC certification -GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification	
3.3.3	Series 170 oil spray system for part lubrication with internal controls	See drawing	170-GD-***	**Engineering Approval Required!**	
3.3.4	VSR oil spray system for part lubrication with external controls	See drawing	VSR-GD-***		
3.3.5	LGTPN Oil + Air Spray Nozzle Assemblies	See drawing	LGPTN-*-NY-**-*** LGPCN-*-NY-**-*** LGPFN-*-NY-**-***	Pinpoint spray pattern Cone spray pattern Fan spray pattern	

3.4. Pump Units Without Reservoir, for Oil

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.4.1	Oil gear, gerotor and vane pumps	See drawing	MFE5-GM0A+*** MFE5-GM0N+*** MFE5-GM0E+*** FLMF**-**** 143-1******-**+***	-GM0A units include motor with CCC certification -GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification	
3.4.2	Piston pump for piston distributor system, pneumatically operated, for oil	See drawing	P-886	30 cm³/stroke	

3.5. Gear and Piston Pump Units with Reservoir, for Oil

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.5.1	Oil gear pump units for piston distributors, clear reservoir	See drawing	MFE5-KW*-GM0A-*** MFE5-KW*-GM0N-*** MFE5-KW*-GM0E-***	-GM0A units include motor with CCC certification -GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification	
3.5.2	Oil gear pump units for piston distributors, metal reservoir	See drawing	MFE5-BW*-GM0A-** MFE5-BW*-GM0N-** MFE5-BW*-GM0E-**	-GM0A units include motor with CCC certification -GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification	
3.5.3	Oil piston pump units for assembly lubrication	See drawing	P-886-BWW7-GM0 P-886-BWW16-GM0		

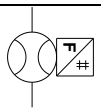
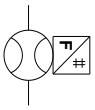
3.6. Pump Units for Fluid Grease

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.6.1	Gear pump unit, 3L clear reservoir, for fluid grease parallel piston distributor systems	See drawing	MFE2-KW3F-GM0A+*** MFE2-KW3F-GM0N-*** MFE2-KW3F-GM0N-***	-GM0A units include motor with CCC certification -GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification The signal of the level switch must be evaluated as a pre-warning signal. The machine shall be switched off after 300 working cycles by a PLC, minimum level.	
3.6.2	Gear pump unit, 6L clear reservoir, for fluid grease parallel piston distributor systems	See drawing	MFE2-KW6F-GM0A-*** MFE2-KW6F-GM0N-*** MFE2-KW6F-GM0E-***	-GM0A units include motor with CCC certification --GM0N units included motor with UL, CSA and CE certification -GM0E units include motor with UL, CSA and CE certification	
3.6.3	Gear pump unit with reservoir for fluid grease	See drawing	CLS-XF1XX2-GM00001	20 to 1500 mm²/s oil NLGI 00, 000	

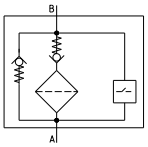
3.7. Piston Pumps for Grease and Fluid Grease

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.7.1	Piston pumps with capacitive level switch for fluid grease	See drawing	KFG1-5W2-GM0*+924 KFG3-5W2-GMO*+924	2 kg 5 kg For greases up to NLGI 1	
3.7.2	Piston pumps with mechanical level switch for grease	See drawing	KFG1-5W1-GM0*+924 KFG3-5W1-GM0*+924	2 kg 5 kg For greases up to NLGI 2	
3.7.3	Piston pump with reservoir, for single line parallel systems.	See drawing	278517 278518	4 liter 8 liter For greases up to NLGI 2 Pump includes reservoir, pressure switch and relief valve	
3.7.4	Piston pump with reservoir	See drawing	KFG1-5W2-S1GM0+924	2 kg	
3.7.5	Piston pump with reservoir	See drawing	KFG1-5W1-S1GM0+924	2 kg	
3.7.6	Blockage indicator	See drawing	PPU-UES-S2		

3.8. Control and Monitoring Units

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.8.1	Level switch for oil		WS35-S30-*** WS35-2-***-GM0		
3.8.2	Level switch for fluid grease		BK6.U117-GM0		
3.8.3	Oil pressure switch, electronic		176-190-020		
3.8.4	Flow monitor, micro flow, electronic		GS300 GS304* 171-100-011 171-210-***		
3.8.5	Oil streak sensor		GS4011-S*** GS6011-S***		

3.9. Filters

Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.9.1	Oil Filter		169-460-***-V57		

3.10. Quick Connect Fitting for 4mm Plastic Secondary Lines

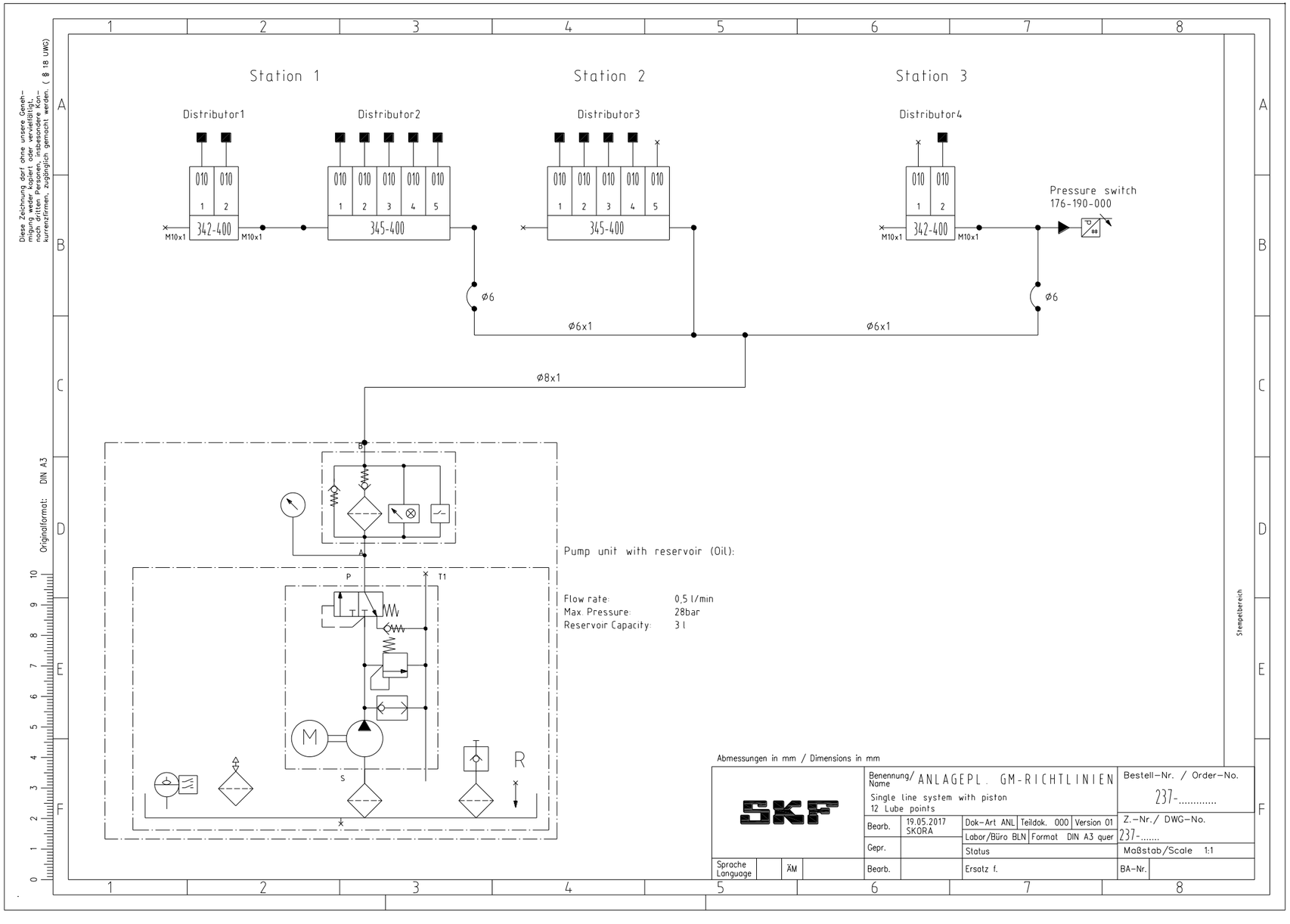
Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.10.1	Push to connect fittings for 4 mm OD plastic tubing	See Brochure	Push to Connect Fittings	Elbows, swivel banjos, and straight adapters	

3.11. Secondary Distribution Lines – 4 mm Plastic Tubing

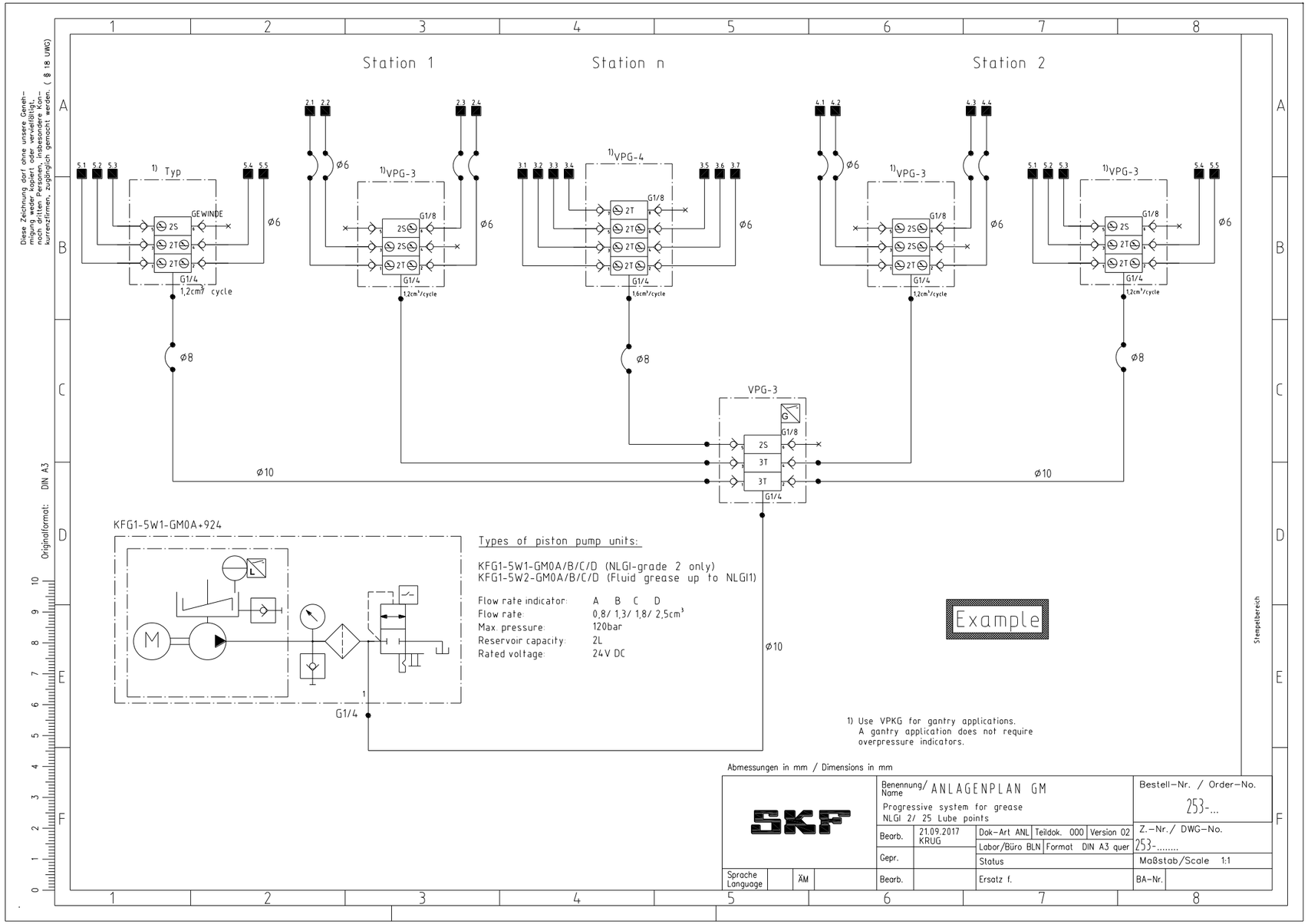
Section No.	Section Title	Symbol	SKF – No.	Remark	GM – No.
3.11.1	Flexible 4 mm tubing for oil and fluid grease up to NLGI 00	See Brochure	WVN716-RO4x0.85	36 bar maximum operating pressure	
3.11.2	Semi-Rigid 4 mm tubing for grease up to NLGI 2	See Brochure	WVN715-RO4X0.85	72 bar maximum operating pressure	

4. Sample Lubrication Schematics

4.1. Single Line Parallel Piston Distributor System



4.2. Single Line Series Progressive System



5. Technical Data / Information

5.1. 341 Series Piston Distributors

SKF MonoFlex prelubrication distributors of product series 341

Configurator

Order code 3 4 1 – [ ][ ][ ] – [ ]0 0 0 0 – 0 0

- Product series
- Number of metering points (1)
- Design code
- Design of lubrication point line connection (VS = SKF quick connectors, 00 = solderless pipe connection)
- Metered quantity code

Design and metered quantity

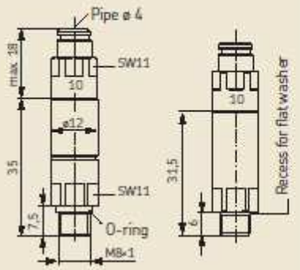
Design code	1	7
Lubricant	Oil	Fluid grease
ø lubrication point line [mm]	4	4
Distributor body material	Aluminium	Aluminium
Metering nipple material	Brass	Brass nickel-plated
Elastomer material	NBR	NBR
Threaded seal material	O-ring [3]	O-ring [3]
Lubrication point line connection	VS 00	VS 00
Metered quantity code / Metered quantity [cm³] 0,01 [1]	1 1	– –
0,02 [1]	– 6	– –
0,03	2 2	2 2
0,06	3 3	3 3
0,10	4 4	4 4
0,16	5 5	– –

[1] Subsequent modification of the metered quantity is not technically possible.
[2] Flat washer must be ordered separately. Order number: DIN7603-A8x11.5-CU
[3] O-ring is part of the shipment

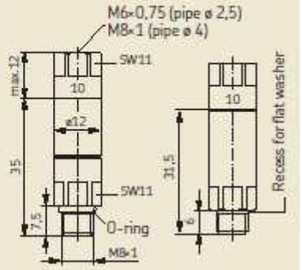
Order example

341-100-30000-00
- Single-port single-line distributor for oil
- NBR design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm
- Metered quantity 0,06 cm³
- O-ring seal on internal thread

Product series 341 + SKF quick connectors (VS)



Product series 341 + solderless pipe connection (00)



Product series 341

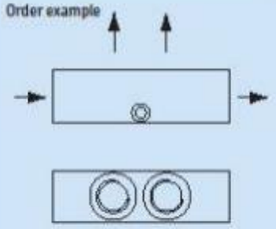
Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	Operating pressure [bar] max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with steel, FKM (FPM)/NBR, brass	0,01 – 0,02	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80
	0,03 – 0,16	00	6	45	≤ 1	0 – 80
		VS	6	80	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00; compatible with steel, FKM (FPM)/NBR, brass	0,03 – 0,10	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80

Manifolds for product series 341

Order code V L – [ ][ ][ ][ ][ ][ ]

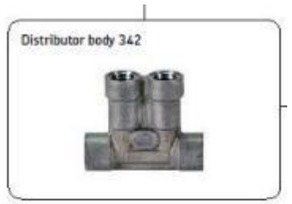
- Product series
- Number of ports
  - 01 = 1 screw-in point
  - 02 = 2 screw-in points
  - 03 = 3 screw-in points
  - 04 = 4 screw-in points
  - 05 = 5 screw-in points
  - 06 = 6 screw-in points
  - (other numbers of ports available on request)
- Design of distributor pipe thread
  - A = Normal profile, M8x1 with counterbore for O-ring
  - D = Small profile, M8x1 with counterbore for flat washer (can only be selected for main line connection M3)
  - F = Normal profile, M8x1 with counterbore for flat washer
- Material
  - A = Aluminum
  - E = Stainless steel (1.4305) (can only be selected for normal profile)
- Design of main line connection
  - G1 = G1/8 per DIN 3852-2, Form X, schmal
  - G2 = G1/4 per DIN 3852-2, Form X, schmal
  - M3 = M10x1 with counterbore for solderless pipe connection per DIN 3862 (➔ page 14)
  - M4 = M14x1,5 with counterbore for solderless pipe connection per DIN 3862 (➔ page 14) (can only be selected for normal profile)

Order example



VL-02AAM3
- Product series VL
- 2 ports
- Normal profile made of aluminum
- M8x1 internal thread with counterbore for O-ring
- M10x1 main line connection with counterbore for solderless pipe connection per DIN 3862

5.2. 340 Series Piston Distributors



Order code 3 4 – – –

Product series

Number of metering points (2, 3, 5)

Code letter

Design of lubrication point line connection (VS = SKF quick connectors, 00 = solderless pipe connection)

Metering point 1

Metering point 2

Metering point 3 (0 = not present, on 342)

Metering point 4 (0 = not present, on 342, 343)

Metering point 5 (0 = not present, on 342, 343)

Metered quantity code

Code for fittings for main line connection on left

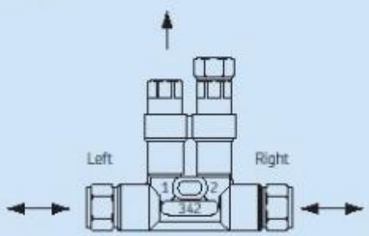
Code for fittings for main line connection on right

Design and metered quantity

Design code	4	5
Lubricant	Oil	Fluid grease
Lubrication point line [mm]	4	4
Distributor body material	Zinc die-cast	Zinc die-cast
Metering nipple material	Brass	Brass, nickel-plated
Elastomer material	NBR	NBR
Lubrication point line connection	VS 00	VS 00
Metered quantity code [cm³] 0,01 [1]	1 1	– –
0,02 [1]	– 6	– –
0,03	2 2	2 2
0,06	3 3	3 3
0,10	4 4	4 4
0,16	5 5	– –
closed [2]	V V	V V

[1] Subsequent modification of the metered quantity is not technically possible.
[2] V = Metered quatity of 0,03 cm³, closed

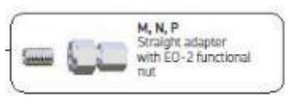
Order example



342-400-2V000-BB
- Two-port single-line distributor for oil
- NBR design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm,
- Metered quantity for port 1 = 0,03 cm³
- Metered quantity for port 2 = 0,03 cm³, closed
- Main line fitting left and right = straight adapter (DIN 3862) with flat washer for pipe ø 6 mm

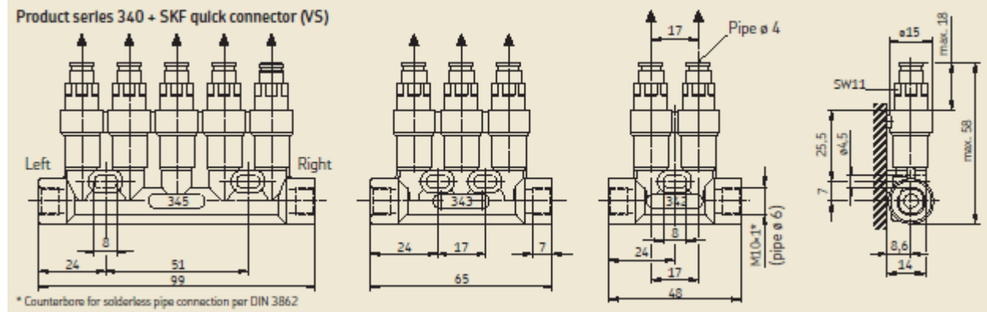
Fittings for main line connection

Description	ø main line [mm]	Code
Straight adapter with EO-2 functional nut	6	M
	8	N
	10	P



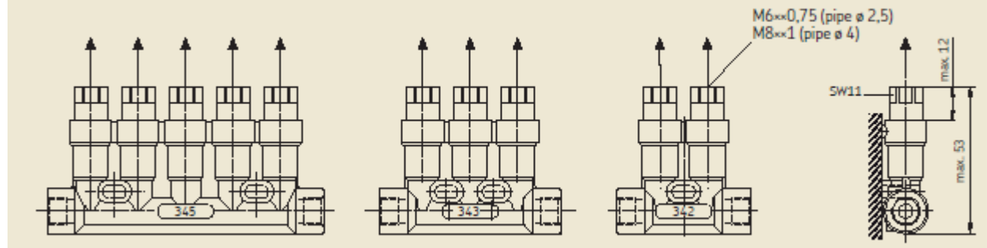
[1] Solderless pipe connection according to DIN 3862 (operating pressure max. 45 bar)
[2] Banjo bolt only inserted in delivery condition, not tightened

Product series 340 + SKF quick connector (VS)



* Counterbore for solderless pipe connection per DIN 3862

Product series 340 + solderless pipe connection (00)



For missing dimensions, → product series 340 + SKF quick connector (VS).

Product series 340

Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with zinc die-cast, FKM (FPM)/ NBR, brass, steel	0,01 – 0,02	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80
	0,03 – 0,16	00	6	45	≤ 1	0 – 80
		VS	6	80	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00; compatible with zinc die-cast, NBR, brass, steel	0,03 – 0,10	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80

5.3. 351 Series Piston Distributors

Order code 3 5 1 – ☐☐☐ – ☐ 0 0 0 0 – 0 0

- Product series
- Number of metering points (1)
- Design code
- Design of lubrication point line connection (VS = SKF quick connectors, 00 = solderless pipe connection)
- Metered quantity code

Design and metered quantity

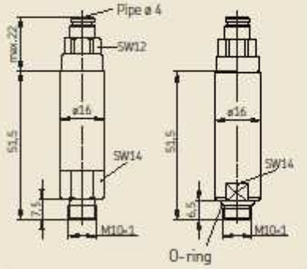
Design code	2	3
Lubricant	Oil	Fluid grease
ø lubrication point line [mm]	4	4
Distributor body material	Aluminum	Aluminum
Metering nipple material	Brass	Brass nickel-plated
Elastomer material	NBR	NBR
Threaded seal material	O-ring 3)	O-ring 3)
Lubrication point line connection	VS 00	VS 00
Metered quantity code / 0,05	– –	– –
Metered quantity code / 0,10	4 4	4 4
Metered quantity code / 0,20	5 5	5 5
Metered quantity code / 0,30	– –	6 6
Metered quantity code / 0,40	6 6	– –
Metered quantity code / 0,60	7 7	– –

[1] Flat washer must be ordered separately. Order number: **504-019**
[2] Stainless steel ring must be ordered separately. Order number: **99-1031-7603**
[3] O-ring is part of the shipment

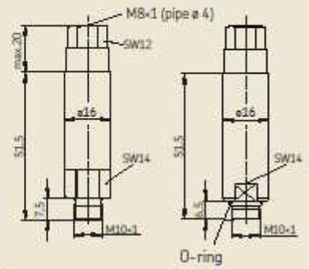
Order example

351-100-70000-00
- Single-port single-line distributor for fluid grease
- NBR design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm
- Metered quantity 0,60 cm³
- With flat washer seal on internal thread

Product series 351 + SKF quick connector (VS)
with seal / with O-ring seal



Product series 351 + solderless pipe connection (00)
with seal / with O-ring seal



Product series 351

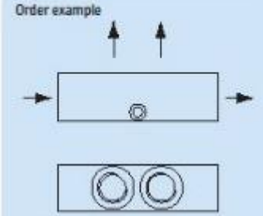
Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	Operating pressure [bar] max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with aluminum, FKM (FPM)/NBR, brass, steel	0,05 – 0,60	00	6	45	≤ 1	0 – 80
		VS	6	80	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00; compatible with aluminum, FKM (FPM)/ NBR, brass	0,10 – 0,60	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80

Manifolds for product series 351

Order code V L – ☐☐☐☐☐☐

- Product series
- Number of ports
  - **01** = 1 screw-in point
  - **02** = 2 screw-in points
  - **03** = 3 screw-in points
  - **04** = 4 screw-in points
  - **05** = 5 screw-in points
  - **06** = 6 screw-in points
  - **(other numbers of ports available on request)**
- Design of distributor pipe thread
  - **B** = Normal profile, M10x1 with counterbore for O-ring
  - **E** = Small profile, M10x1 with counterbore for flat washer **(can only be selected for main line connection M3)**
  - **G** = Normal profile, M10x1 with counterbore for flat washer
- Material
  - **A** = Aluminum
  - **E** = Stainless steel (1.4305) **(can only be selected for normal profile)**
- Design of main line connection
  - **G1** = G1/8 per DIN 3852-2, Form X, schmal
  - **G2** = G1/4 per DIN 3852-2, Form X, schmal
  - **M3** = M10x1 with counterbore for solderless pipe connection per DIN 3862 (→ page 14)
  - **M4** = M14x1,5 with counterbore for solderless pipe connection per DIN 3862 (→ page 14) **(can only be selected for normal profile)**

Order example



VL-02BAM3
- Product series VL
- 2 ports
- Normal profile made of aluminum
- M10x1 internal thread with counterbore for O-ring
- M10x1 main line connection with counterbore for solderless pipe connection per DIN 3862

5.4. 350 Series Piston Distributors

Order code 3 5 – – – –

Product series

Number of metering points (2, 3, 5)

Code

Design of lubrication point line connection (VS = SKF quick connectors, 00 = solderless pipe connection)

Metering point 1

Metering point 2

Metering point 3 (0 = not present, on 352)

Metering point 4 (0 = not present, on 352, 353)

Metering point 5 (0 = not present, on 352, 353)

Code for fittings for main line connection on left

Code for fittings for main line connection on right

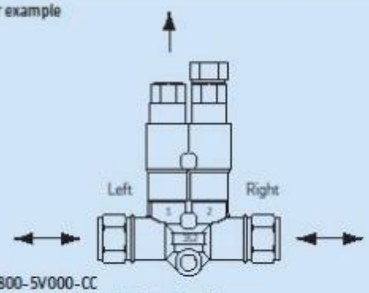
Metered quantity code

Design and metered quantity

Design key Design	0	1
Lubricant	Oil	Fluid grease
ø lubrication point line [mm]	4	4
Distributor body material	Zinc die-cast	Zinc die-cast
Metering nipple material	Brass	Brass nickel-plated
Elastomer material	NBR	NBR
Lubrication point line connection	VS 00	VS 00
Metered quantity code [cm³] 0,05	3 3	– –
0,10	4 4	4 4
0,20	5 5	5 5
0,30	– –	6 6
0,40	6 6	– –
0,60	7 7	– 7
closed *	V V	V V

* V = Metered quatity of 0,20 cm³, closed

Order example



352-800-5V000-CC
- Two-port single-line distributor for oil
- FPM design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm,
- Metered quantity for port 1 = 0,20 cm³
- Metered quantity for port 2 = 0,20 cm³ closed
- Main line fitting left and right = straight adapter (DIN 3862) with flat washer for pipe ø 8 mm

Fittings for main line connection

Description	Main line [mm]	Code
Straight adapter with EO-2 functional nut	6	M
	8	N
	10	P

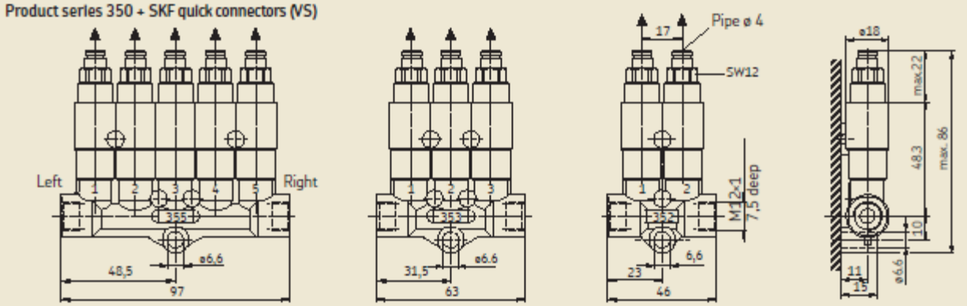
M, N, P. Straight adapter with EO-2 functional nut

1) Solderless pipe connection according to DIN 3862 (operating pressure max. 45 bar)
2) Banjo bolt only inserted in delivery condition, not tightened

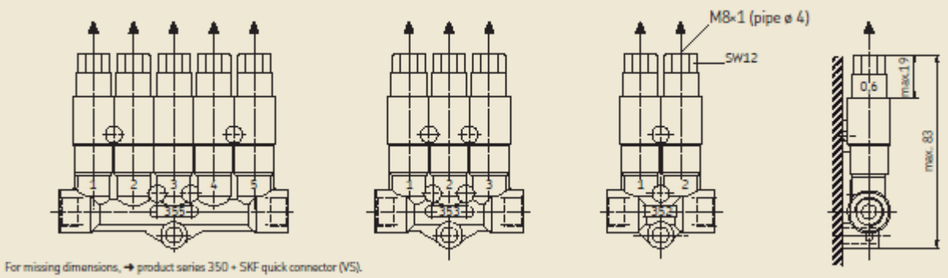
Product series 350

Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with zinc die-cast, FKM (FPM)/ NBR, brass, steel	0,05 – 0,60	00	6	45	≤ 1	0 – 80
		VS	6	80	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00; compatible with zinc die-cast, NBR, brass, steel	0,10 – 0,60	00	12	45	max. 3	0 – 80
		VS	12	80	max. 3	0 – 80

Product series 350 + SKF quick connectors (VS)



Product series 350 + solderless pipe connection (00)



For missing dimensions, ➜ product series 350 + SKF quick connector (VS).

5.5. 391 Series Piston Distributors

Order code 3 9 1 – _ 0 0 – _ 0 0 0 0 – 0 0

Product series

Number of metering points (1)

Design code

Design of lubrication point line connection (**VS** = SKF quick connectors, **00** = solderless pipe connection)

Metered quantity code

Design and metered quantity

Design code	0	8	1
Lubricant	Oil	Oil	Fluid grease
ø lubrication point line [mm]	4	4	4
Distributor body material	Aluminum	Aluminum	Aluminum
Metering nipple material	Brass	Brass	Brass, nickel-plated
Elastomer material	NBR	FKM (FPM)	NBR
Threaded seal material	Flat washer*	Flat washer*	Flat washer*
Lubrication point line connection	00	00	00
Metered quantity code [cm³] 0,10	–	–	4
0,20	5	5	5
0,30	–	–	6
0,40	6	6	–
0,60	7	7	–
1,00	8	8	–
1,50	9	9	

* Flat washer must be ordered separately. Order number: **DIN7603-A14x18-CU**

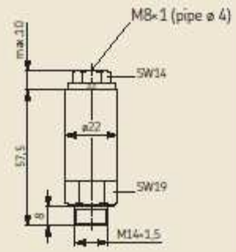
Order example

391-100-60000-00
- Single-port single-line distributor for fluid grease
- NBR design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm
- Metered quantity 0,30 cm³
- Flat washer seal on internal thread

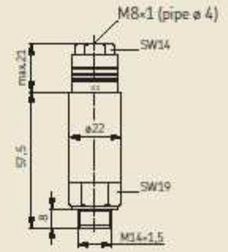
Product series 391

Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with aluminum, FKM (FPM)/ NBR, brass, steel	0,2 – 1,5	00	8	45	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00, 0; compatible with aluminum, NBR, brass, steel	0,1 – 0,3	00	26	45	max. 7	0 – 80

Product series 391 for oil + solderless pipe connection (00)



Product series 391 for fluid grease + solderless pipe connection (00)



Manifolds for product series 391

Order code V L – _ _ C A _ _

Product series

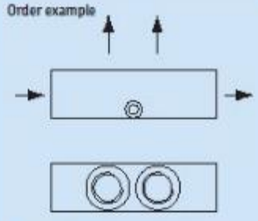
Number of ports
01 = 1 screw-in point
02 = 2 screw-in points
03 = 3 screw-in points
04 = 4 screw-in points
05 = 5 screw-in points
06 = 6 screw-in points
(other numbers of ports available on request)

Design of distributor pipe thread
C = Normal profile, M14x1,5 with counterbore for flat washer

Material
A = Aluminum

Design of main line connection
G1 = G1/8 per DIN 3852-2, Form X, schmal
G2 = G1/4 per DIN 3852-2, Form X, schmal
M3 = M10x1 with counterbore for solderless pipe connection per DIN 3862 (→ page 14)
M4 = M14x1,5 with counterbore for solderless pipe connection per DIN 3862 (→ page 14)

Order example



VL-02CAM3
- Product series VL
- 2 ports
- Normal profile made of aluminum
- M14x1,5 internal thread with counterbore for flat washer
- M10x1 main line connection with counterbore for solderless pipe connection per DIN 3862

Metering nipple 00 (for solderless pipe connection per DIN 3862)

Distributor body 391

Manifold VL

5.6. 390 Series Piston Distributors

Order code 3 9 _ – _ 0 0 – _ _ _ 0 0 – _ _

Product series

Number of metering points (2, 3)

Code

Design of lubrication point line connection (00 = solderless pipe connection)

Metering point 1

Metering point 2

Metering point 3 (0 = not present, on 392)

Metered quantity code

Code for fittings for main line connection on left

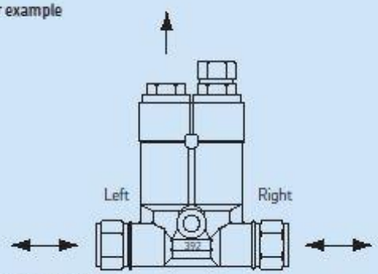
Code for fittings for main line connection on right

Design and metered quantity

Design code	0		1
Lubricant	Oil		Fluid grease
ø lubrication point line [mm]	4		4
Distributor body material	Zinc die-cast		Zinc die-cast
Metering nipple material	Brass		Brass, nickel-plated
Elastomer material	NBR		NBR
Lubrication point line connection	00		00
Metered quantity code [cm³] 0,10	–		4
0,20	5		5
0,30	–		6
0,40	6		–
0,60	7		–
1,00	8		–
1,50	9		–
closed *	V		V

* V = Metered quatity of 0,20 cm³, closed

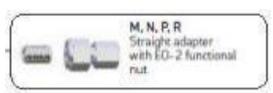
Order example



392-800-5V000-CC
- Two-port single-line distributor for oil
- FPM design
- Lubrication point line connection per DIN 3862 for pipe ø 4 mm
- Metered quantity for port 1 = 0,20 cm³
- Metered quantity for port 2 = 0,20 cm³ closed
- Main line fitting left and right = straight adapter (DIN 3862) with flat washer for pipe ø 8 mm

Fittings for main line connection

Description	ø main line [mm]	Code
Straight adapter with EO-2 functional nut	6	M
	8	N
	10	P
	12	R

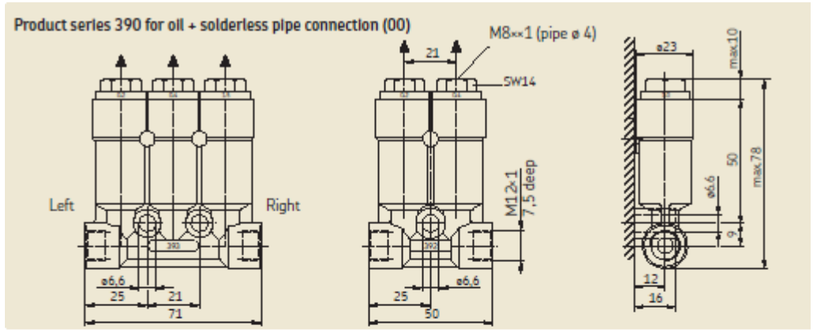


1) Banjo bolt only inserted in delivery condition, not tightened

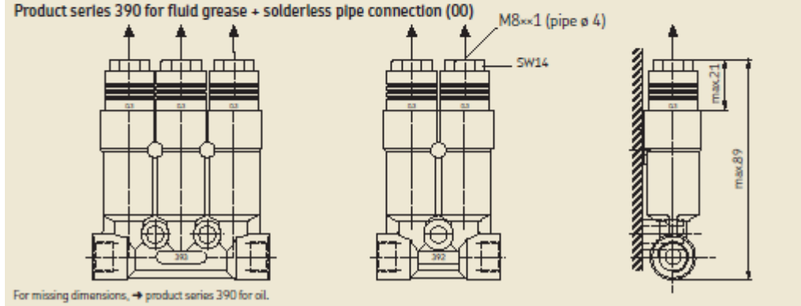
Product series 390

Lubricant	Metered quantity [cm³]	Metering nipple	Operating pressure [bar] min.	max.	Relief pressure [bar]	Operating temperature [°C]
Mineral and synthetic oil 20 – 2 000 mm²/s; compatible with zinc die-cast, FKM (FPM)/ NBR, brass, steel	0,2 – 1,5	00	8	45	≤ 1	0 – 80
Fluid grease of NLGI Grade 000, 00, 0; compatible with zinc die-cast, NBR, brass, steel	0,1 – 0,3	00	26	45	max. 7	0 – 80

Product series 390 for oil + solderless pipe connection (00)

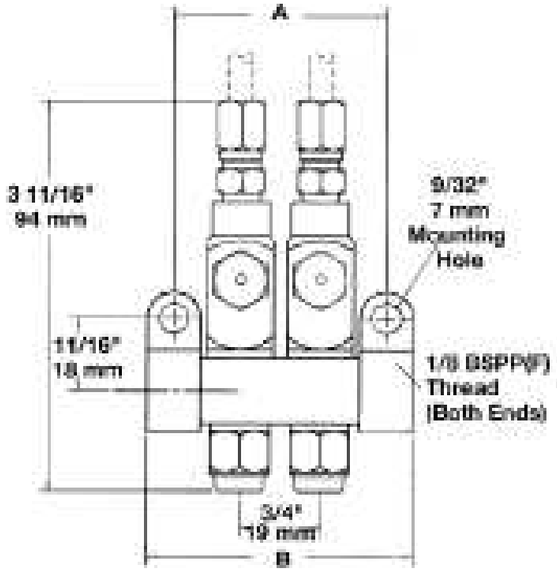


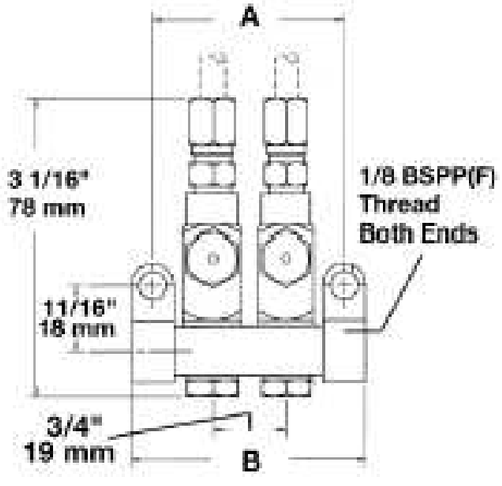
Product series 390 for fluid grease + solderless pipe connection (00)



For missing dimensions, ➜ product series 390 for oil.

5.7. SL-33 Injector Manifold





Model	Outlets	Connections		Dimensions			
Grease SL-33		Inlet	Outlet	A (in)	A (mm)	B (in)	B (mm)
85351-1	1	1/8 BSPP (f)	6 mm OD tube connection	1-1/8	29	1-5/8	41
85351-2	2			1-7/8	48	2-3/8	60
85351-3	3			2-5/8	67	3-1/8	79
85351-4	4			3-3/8	86	3-7/8	98
85351-5	5			4-1/8	105	4-5/8	118
85351-6	6			4-7/8	124	5-3/8	137

5.8. VPG Progressive Feeders

Technical data

Type	Hydraulically controlled
Mounting position	Any [1]
Ambient temperature range	–25 to +90 °C
Feeder section	See table
Occupied outlets	1 to 20

Material

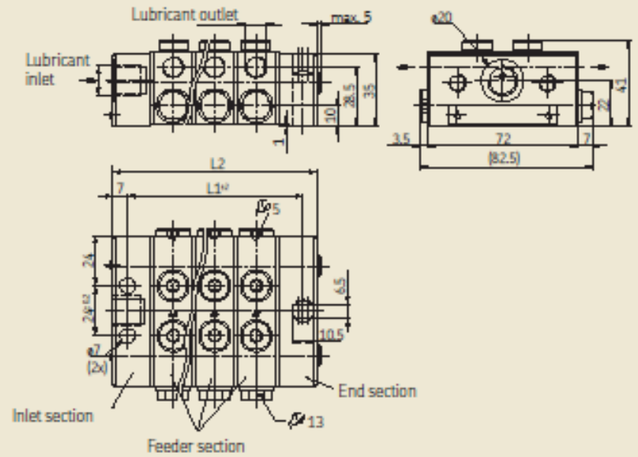
Inlet, separator and end section	Steel, galvanized, NBR
Sections	Steel, galvanized

Hydraulic system

Operating pressure, max.	Oil 200 bar, grease 300 bar
Volume per outlet and cycle	See table
Lubricant	Mineral oils, greases based on mineral oil, environmentally friendly and synthetic oils and greases
Operating viscosity	> 12 mm²/s
Worked penetration	≥ 265 x 0,1 mm (up to NLGI Grade 2)

[1] In case of installation on moving machine parts or in case of strong vibrations (e.g., on pressing machines), the piston position of the feeder must not match the direction of movement of the machine part; instead, it must be at a 90° angle to the force of the machine.

VP sectional metering device, basic design



Dimensions

Inlet: VPG = G1/4 Outlet: VPG = G1/8

Typ	Number of feeder sections	Number of possible outlets	L1 [mm]	L2 [mm]	Weight [kg]
VPG-3	3	6	84	98	1.73
VPG-4	4	8	104	118	2.1
VPG-5	5	10	124	138	2.47
VPG-6	6	12	144	158	2.84
VPG-7	7	14	164	178	3.21
VPG-8	8	16	184	198	3.58
VPG-9	9	18	204	218	3.95
/ VPG-10	10	20	224	238	4.32

5.9. VPG Progressive Feeders (cont'd)

Order code: VP 1 2 3 4 5 6 7 – _ _ _ _ _ _ _ _ _ _

Feeder information — Choice 8/9/10: information on sections 1 to 10 as seen from inlet

Order example: VPG3DXXEX-LDD-GDD-QHS-QSE (→ page 14)

1 Thread type

Inlet thread G1/4, outlet thread G1/8	G

2 Selection of monitoring

none	X
Piston detector 2-pin, with M12×1 plug	2
Piston detector 3-pin, with M12×1 plug (wire breakage protection)	3
Cycle indicator, visual (plunger rod) 1)	Y

1) The installation of the cycle indicator is only possible from feeder section 2T and 2S, respectively!

3 Selection of installation position for monitor

X none

left-hand side		right-hand side
U	10	V
S	9	T
Q	8	R
N	7	P
L	6	M
J	5	K
G	4	H
E	3	F
C	2	D
A	1	B

Inlet

4 Selection of attachments

	VPG
none	X
Flow limiter with nominal volume up to 1.09 l/min → Plug-in nozzles table 5	A
4/2-directional solenoid valve for oil, continuity to feeder normally open (NO) P–A	B
4/2-directional solenoid valve for oil, continuity to feeder normally closed (NC) P–A	C
2/2-directional solenoid valve for oil, continuity to feeder normally closed (NC)	E
2/2-directional solenoid valve for grease, continuity to feeder normally closed (NC)	F

5 Plug-in nozzles for flow limiter 2)

Nominal volume [l/min]	Nozzle-ø [mm]		Nominal volume [l/min]	Nozzle-ø [mm]	
none		X	0.47	0.9	J
0.08	0.5	A	0.56	0.95	K
0.12	0.55	B	0.65	1	L
0.15	0.6	C	0.73	1.05	M
0.21	0.65	D	0.79	1.1	N
0.25	0.7	E	0.88	1.15	P
0.29	0.75	F	0.98	1.2	Q
0.35	0.8	G	1.09	1.25	R
0.41	0.85	H			

2) The values in the table are based on a differential pressure of 20 bar and viscosity of 300 mm²/s. Other differential pressures or viscosities result in slightly different delivery rates. These can be determined precisely using the charts for delivery rates and correction factors for the pressure (→ brochure 2-2026-EN).

6 Selection of inlet screw union

	VPG
none	X
Straight connector for tube ø 6 mm 1), L	–
Straight connector for tube ø 6 mm 1), S	B
Straight connector for tube ø 8 mm 1), L	C
Straight connector for tube ø 8 mm 1), S	–
Straight connector for tube ø 10 mm 1), L	E
Straight connector for tube ø 12 mm 1), L	F
Straight connector, E02 for tube ø 6 mm	G
Straight connector, E02 for tube ø 8 mm	H
Straight connector, E02 for tube ø 10 mm	J
Straight connector, E02 for tube ø 12 mm	K
Quick connector for tube ø 6 mm	L
Elbow for tube ø 8 mm, tapered 1), L	M
Elbow for tube ø 10 mm, tapered 1), L	N
Banjo fitting for tube ø 6 mm 1), S	P
Banjo fitting for tube ø 8 mm 1), L	Q
Banjo fitting for tube ø 10 mm 1), L	R

1) Solderless pipe unions with cutting sleeve acc. to DIN 2353

7 Options

none	X
Blockage indicator on all open outlets (opening pressure)	
Open at 50 bar	R
Open at 100 bar	S
Open at 150 bar	T
Open at 200 bar	U

8 Selection of feeder sections

1st place section size 2) (seen from the inlet)

Number of outlets 2 (Twin) Volume per cycle and outlet [mm³] 3)	Designation of sections		Number of outlets 1 (Single) Volume per cycle and outlet [mm³] 3)	Designation of sections	
100	1T	C	200	1S	D
200	2T	E	400	2S	F
300	3T	G	600	3S	H
400	4T	J	800	4S	K
500	5T	L	1000	5S	M
600	6T	N	1200	6S	Q

2) Smallest possible feeder size = 3 effective sections
3) Data in cm³ → page 6

LL-series = extra light version, L-series = light version, S-series = heavy duty version
CV = Check valve

9 10 2nd place outlet screw union, left-hand side; 3rd place outlet screw union, right-hand side

	VPG
No outlet port, screw plug	S
Outlet port without screw unions	X
Outlet port with 4 mm outlet screw union 4), tapered, LL	–
Outlet port with 4 mm outlet screw union 4), LL	B
Outlet port with 6 mm outlet screw union 4), tapered, LL	–
Outlet port with 6 mm outlet screw union 4), L	D
Outlet port with 8 mm outlet screw union 4), tapered, LL	E
Outlet port with 10 mm outlet screw union 4), tapered, L	F
Outlet port with 4 mm outlet screw union, EO2 4)	G
Outlet port with 6 mm outlet screw union, EO2 4)	J
ø4 mm quick connector	K
ø4 mm quick connector, tapered	–
ø6 mm quick connector	M
ø6 mm quick connector, tapered	N
Outlet port with 4 mm outlet screw union, with CV	P
Outlet port with 6 mm outlet screw union, with CV	Q
Outlet port with 8 mm outlet screw union, with CV	T
Outlet port with 10 mm outlet screw union, with CV	–
Outlet port with 4 mm banjo fitting 4), LL	W
Outlet port with 6 mm banjo fitting 4), L	Z
Outlet port with 6 mm banjo fitting 4), LL	–
4 mm quick connector-banjo fitting	2
4 mm quick connector-banjo fitting, tapered	–
6 mm quick connector-banjo fitting	4
6 mm quick connector-banjo fitting, tapered	–
Crossporting forwards (seen from the inlet)	V
Crossporting backwards (seen from the inlet)	H

4) Solderless pipe unions with cutting sleeve acc. to DIN 2353

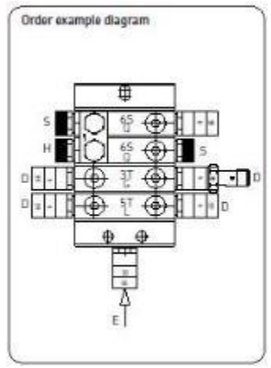
Selection of outlet ports (indicate selections 9 and 10)

left-hand → 9 | 10 → right-hand

	10	
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	

Inlet

Order example diagram



Order code: VPG3DXXEX-LDD-GDD-QHS-QSE

Designation	
Description	**Clarification**
Progressive sectional metering device	VP
1 Thread type	G (inlet thread G1/4, outlet thread G1/8)
Feeder size	4 sections
2 Monitoring type	3 (P3 piston detector 3-pin, with M12×1 plug)
3 Mounting position of the monitoring system	D (right-side, on 2nd section)
4 Attachments	X (without)
5 Plug-in nozzles for flow limiter attachment	X (without)
6 Inlet screw union	E (Straight connector for tube ø 10 mm, L)
7 Option	X (without blockage indicator)
1. Section	
8 Feeder section	L (5T – 0,50 cm³, 2 outlets)
9 left side of section	D (Straight connector for tube ø 6 mm, L)
10 right side of section	D (Straight connector for tube ø 6 mm, L)
2. Section	
8 Feeder section	G (3T – 0.30 cm³, 2 outlets)
9 left side of section	D (Straight connector for tube ø 6 mm, L)
10 right side of section	D (Straight connector for tube ø 6 mm, L)
3. Section	
8 Feeder section	Q (6S – 1.20 cm³, 1 outlet)
9 left side of section	H (Crossporting backwards)
10 right side of section	S (no outlet port, screw plug)
4. Section	
8 Feeder section	Q (6S – 1.20 cm³, 1 outlet)
9 left side of section	S (no outlet port, screw plug)
10 right side of section	E (Straight connector for tube ø 8 mm, tapered, LL)

5.10. VPKG Progressive Feeders

Technical data

Type	Hydraulically controlled
Mounting position	Any
Ambient temperature range	–25 to + 90 °C
Feeder section	→ Table 1
Occupied outlets	1 to 20
Material	
Inlet, separator and end section	Steel, galvanized, NBR
Sections	Steel, galvanized
Hydraulic system	
Operating pressure, max.	Oil 200 bar, grease 300 bar
Volume per outlet and cycle	→ Table 2
Lubricant	Mineral oils, greases based on mineral oil, environmentally friendly and synthetic oils and greases
Operating viscosity	> 12 mm²/s
Worked penetration	≥ 265 x 0.1 mm (up to NLGI Grade 2)

VPK sectional metering device, basic design

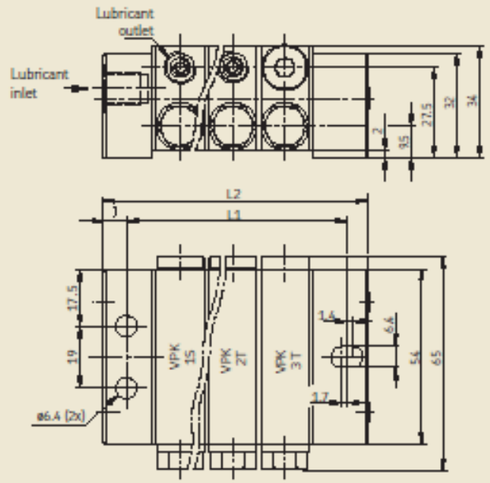


Table 1

Dimensions

Inlet: VPKG = G1/8 Outlet: VPKG = G1/8

Typ	Number of feeder sections	Number of possible outlets	L1 [mm]	L2 [mm]	Weight [kg]
VPKG-3	3	6	68.4	81.9	0.99
VPKG-4	4	8	84.6	98.1	1.18
VPKG-5	5	10	100.8	114.3	1.38
VPKG-6	6	12	117.0	130.5	1.57
VPKG-7	7	14	133.2	146.7	1.77
VPKG-8	8	16	149.4	162.9	1.96
VPKG-9	9	18	165.6	179.1	2.16
/ VPKG-10	10	20	181.8	195.3	2.35

5.11. VPKG Progressive Feeders (cont'd)

Order code VPK 1 2 3 4 5 – _ _ _ _ _ _ _ _ _ _

Feeder information — Choice 6/7/8: information on sections 1 to 10 as seen from inlet (min. 3 sections)

Order example: VPKGYFXC–EMM–CMV–HSM–DMS–EMM (→ page 12)

1 Thread type

Inlet- and outlet thread G1/8	G

2 Selection of monitoring

none	X
Piston detector 2-pin, with M12×1 plug	2
Piston detector 3-pin, with M12×1 plug (wire breakage protection)	3
Cycle indicator, visual (plunger rod) 1)	Y
Cycle indicator with holder and proximity switch M12×1 1)	S
Cycle indicator with holder for proximity switch M12×1 (without proximity switch) 1)	G

1) The installation of the cycle indicator is **only** possible from feeder section 2T and 2S, respectively!
Installation not recommended on first or last segment.

3 Selection of installation position for monitor

X none

left-hand side		right-hand side
U	10	V
S	9	T
Q	8	R
N	7	P
L	6	M
J	5	K
G	4	H
E	3	F
C	2	D
A	1	B

Inlet

4 Selection of attachments

	VPKG
none	X
4/2-directional solenoid valve for oil	B
3/2-directional solenoid valve for oil	D
2/2-directional solenoid valve for oil	E

5 Selection of inlet screw union

	VPKG
none	X
Straight connector for tube ø6 mm, L 1)	A
Straight connector for tube ø6 mm, tapered LL 1)	–
Straight connector for tube ø8 mm, tapered LL 1)	C
Straight connector for tube ø10 mm, tapered L 1)	D
Straight connector, E02 for tube ø6 mm	E
Straight quick connector for tube ø6 mm	F
Straight quick connector for tube ø6 mm, tapered	G
Elbow for tube ø6 mm, tapered, L 1)	H
Elbow for tube ø6 mm, tapered, LL 1)	–
Elbow for tube ø8 mm, tapered, LL 1)	K
Elbow quick connector, ø6 mm, tapered	L
Banjo fitting for tube ø6 mm, L 1)	M
Banjo fitting for tube ø6 mm, LL 1)	–
Banjo fitting quick connector for tube ø6 mm	P
Banjo fitting quick connector for tube ø6 mm, tapered	–

LL-series = extra light version, L-series = light version, S-series = heavy duty version

1) Solderless pipe unions with cutting sleeve acc. to DIN 2353

Sectional metering device of product series VPK VPK

6 Selection of feeder sections

1st place section size 1) (seen from the inlet)

Number of outlets 2 (Twin) Volume per cycle and outlet [cm³]	Designation of sections		Number of outlets 1 (Single) Volume per cycle and outlet [cm³]	Designation of sections	
0.05	05T	A	0.10	05S	B
0.10	1T	C	0.20	1S	D
0.20	2T	E	0.40	2S	F
0.30	3T	G	0.60	3S	H

1) Smallest possible feeder size = 3 effective sections

Selection of outlet ports (indicate selections 7 and 8!)

left-hand → 7 | 8 → right-hand

7		8
	10	
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	

Inlet

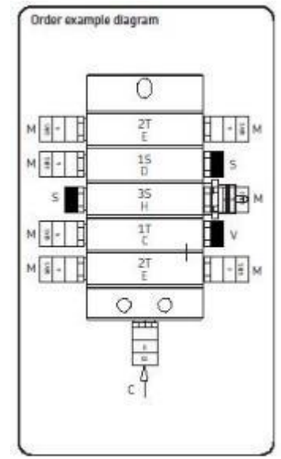
7 8 2nd place outlet screw union, left-hand side; 3rd place outlet screw union, right-hand side

	VPKG
No outlet port, screw plug	S
Outlet port without screw unions	X
Outlet port with 4 mm outlet screw union 2), tapered, LL	–
Outlet port with 4 mm outlet screw union 2), LL	B
Outlet port with 6 mm outlet screw union 2), tapered, LL	–
Outlet port with 6 mm outlet screw union 2), L	D
Outlet port with 8 mm outlet screw union 2), tapered, LL	E
Outlet port with 10 mm outlet screw union 2), tapered, L	F
Outlet port with 4 mm outlet screw union, E02	G
Outlet port with 6 mm outlet screw union, E02	J
ø4 mm quick connector	K
ø4 mm quick connector, tapered	–
ø6 mm quick connector	M
ø6 mm quick connector, tapered	N
Outlet port with 6 mm outlet screw union, with CV	Q
6 mm quick connector-banjo fitting, with CV	–
Outlet port with 4 mm banjo fitting 2), LL	W
Outlet port with 6 mm banjo fitting 2), L	1
Outlet port with 6 mm banjo fitting 2), LL	–
4 mm quick connector-banjo fitting	3
4 mm quick connector-banjo fitting, tapered	–
6 mm quick connector-banjo fitting	5
6 mm quick connector-banjo fitting, tapered	–
Crossporting forwards (seen from the inlet)	V

2) Solderless pipe unions with cutting sleeve acc. to DIN 2353

LL-series = extra light version, L-series = light version
CV = Check valve

Order example diagram



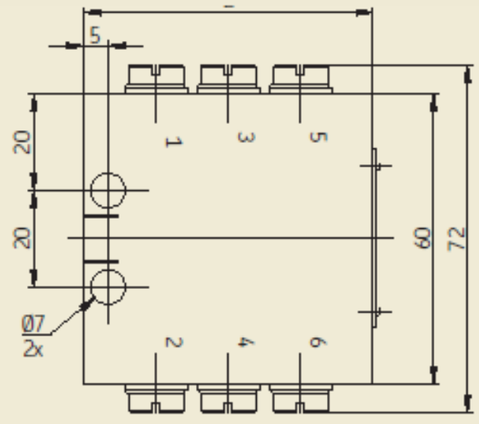
Order code: VPKGYFXC–EMM–CMV–HSM–DMS–EMM

Designation

Description		Clarification
	Progressive sectional metering device	VPK
1	Thread type	G (inlet and outlet thread G1/8)
	Feeder size	5 sections
2	Monitoring type	Y (cycle indicator, visual)
3	Mounting position of the monitoring system	F (right-side, on 3rd section)
4	Attachments	X (without)
5	Inlet screw union	C (straight connector for tube ø 8mm, tapered, LL)
	1. Section	
6	Feeder section	E (2T – 0.20 cm³, 2 outlets)
7	left side of section	M (straight quick connector for tube ø6 mm)
8	right side of section	M (straight quick connector for tube ø6 mm)
	2. Section	
6	Feeder section	C (1T – 0.10 cm³, 2 outlets)
7	left side of section	M (straight quick connector for tube ø6 mm)
8	right side of section	V (Crossporting nach vorne)
	3. Section	
6	Feeder section	H (3S – 0.60 cm³, 1 outlet)
7	left side of section	S (no outlet port, screw plug)
8	right side of section	M (straight quick connector for tube ø6 mm)
	4. Section	
6	Feeder section	D (1S – 0.20 cm³, 1 outlet)
7	left side of section	M (straight quick connector for tube ø6)
8	right side of section	S (no outlet port, screw plug)
	5. Section	
6	Feeder section	E (2T – 0.20 cm³, 2 outlets)
7	left side of section	M (straight quick connector for tube ø6 mm)
8	right side of section	M (straight quick connector for tube ø6 mm)

5.12. VPBG Progressive Feeders

Fig. 6 Block feeder VPB, basic design



Dimensions

Type	Number of feeder sections	Number of possible outlets	L [mm]
) / VPBG-3 [1]	3	6	60
VPBG-4	4	8	75
VPBG-5	5	10	90
VPBG-6	6	12	105
VPBG-7	7	14	120
VPBG-8	8	16	135
VPBG-9	9	18	150
/ VPBG-10	10	20	165

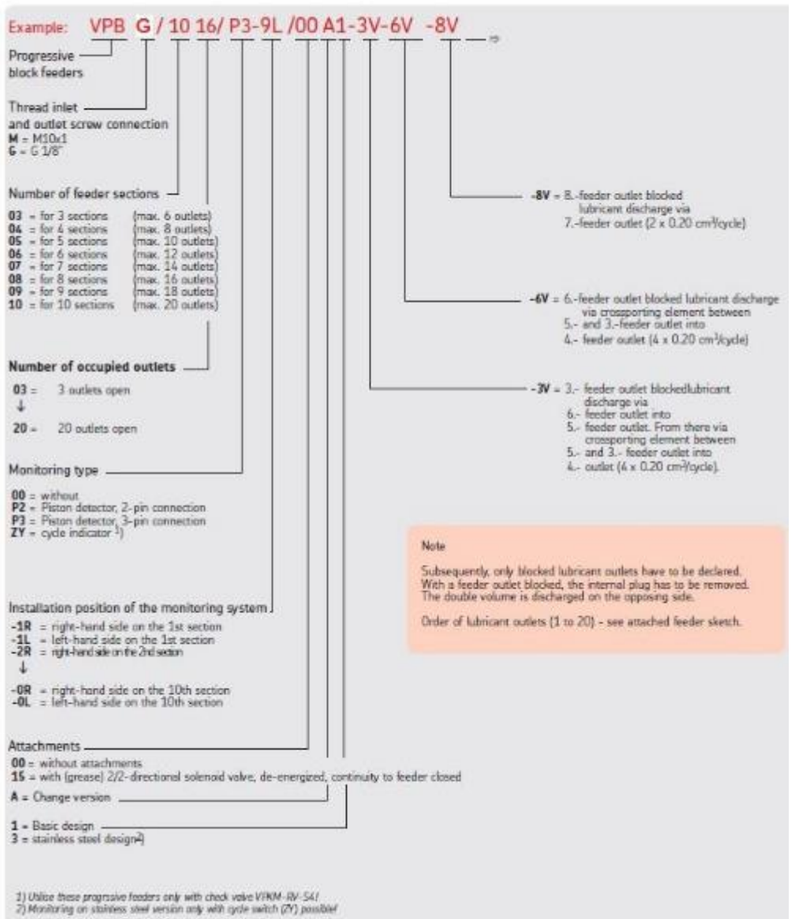
1) This progressive feeder must be installed with check valves

Technische Daten

Style	hydraulically controlled
Mounting position	discretionary
Screw connection	I/O VPBG = G1/8"
Umgebungstemperaturbereich	-25 bis +110 °C
Quantity of outlets	3 to 20
Material	
Inlet plate/end plate	Steel, tinned/nitrile
Hydraulic	
Operating pressure max.:	Oil 200 bar, grease 300 bar
Volume per outlet and cycle	0,20 cm^3
Lubricant	Mineral oils, greases based on mineral oil, environmentally friendly and synthetic oils and greases
Operating viscosity	> 12 mm^2/s
Worked penetration	≥ 265 × 0.1 mm (up to NLGI grade 2)

Explanation of the order codes

Structure



Note

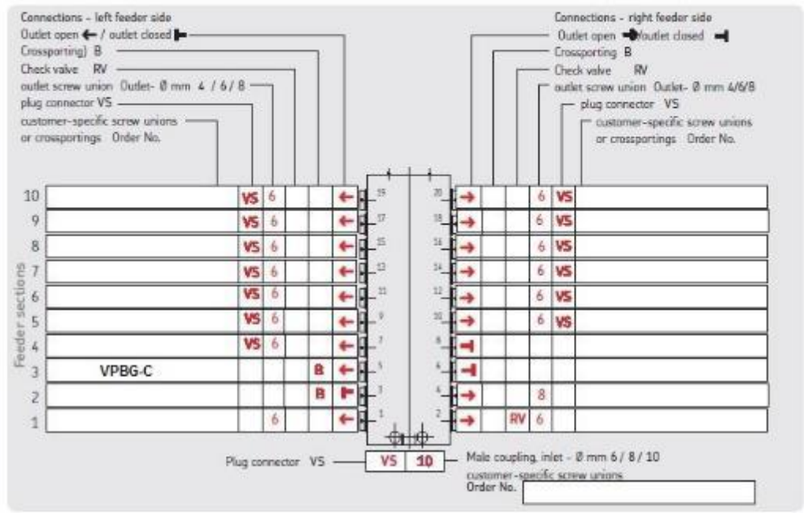
Subsequently, only blocked lubricant outlets have to be declared.
With a feeder outlet blocked, the internal plug has to be removed.
The double volume is discharged on the opposing side.

Order of lubricant outlets (1 to 20) - see attached feeder sketch.

1) Utilize these progressive feeders only with check valve VFKM-RV-SA1
2) Monitoring on stainless steel version only with cycle switch (ZY) possible!

Explanation of the order codes

Attachments and screw unions



How to order:

Progressive feeder, type VPB (VPB), with inlet- and outlet thread **G1/8 (G)** , 10 feeder pisten (10), with 16 occupied outlets (16), with monitoring via 3-pin piston detector (P3), installed on the left side of the 9th feeder pisten (down feeder outlet 17) (9L), without attachments (00), change version A (A), basic design (1).

From the 20 existing lubricant-exits, following exits are locked:

3rd feeder outlet closed (-3V), lubricant-output takes place from the 6th feeder outlet to 5th feeder outlet. From there, over crossport 5rd and 3rd feeder-exit, to the 4rd feeder-exit (4 x 0,20 cm³/stroke)

6th feeder outlet closed (-6V), lubricant-output takes place over crossport 5rd and 3rd feeder-exit of the 4rd feeder-exit (4 x 0,20 cm³/stroke)

8th feeder outlet closed (-8V), lubricant-output takes place over 7rd feeder-exit (2 x 0,20 cm³/stroke).

Following Crossportings (B) are (from the entrance seen) the progressive-feeder (C, C2, C3, C4), Check valves (RV), outlet screw unions (4/6/8) or plug connectors (VS) been assigned:

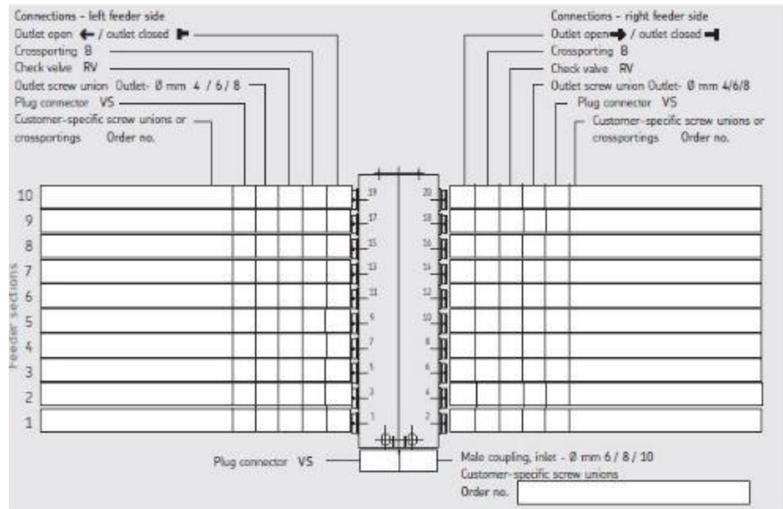
Inlet screw union = Ø 6 mm (6).

1st feeder outlet and 2nd feeder outlet = outlet screw union with Ø 6 mm (6) right with additional check valve (RV),
3nd feeder outlet = crossport from 5nd feeder outlet (B) crossport version VPBG-C
4nd feeder outlet = outlet screw union Ø 8 mm (8)
5nd feeder outlet = crossport to 3nd feeder outlet (B), crossport version VPBG-C
6nd feeder outlet = closed (-|)
7nd feeder outlet = outlet screw union with Ø 6 mm (6) and with plug connector (VS)
8nd feeder outlet = closed (-|)
9nd to 10nd feeder outlet = outlet ever Ø 6 mm (6) with plug connectors (VS).

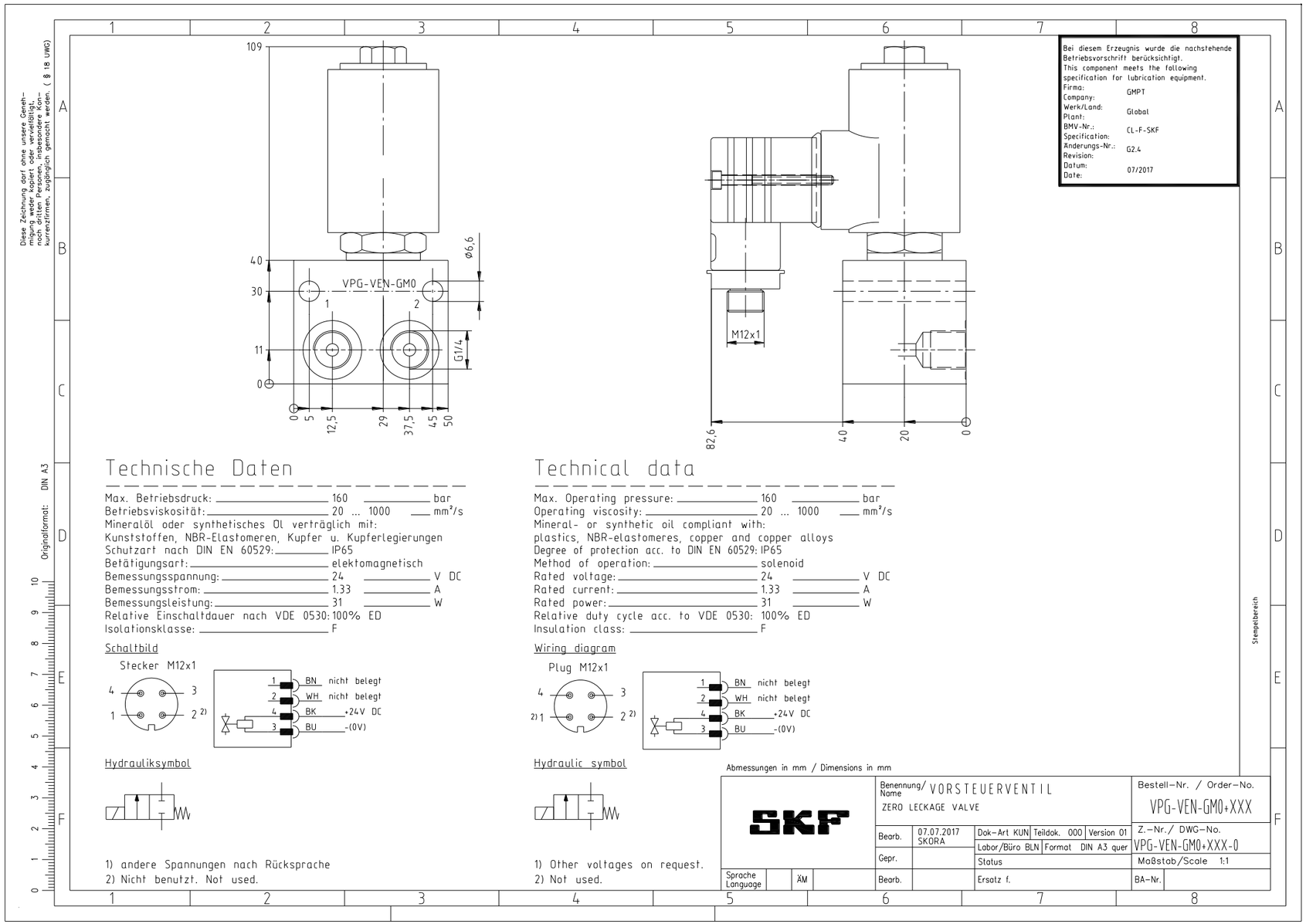
Configuration order code VPB

VPB G / 10 16 / P3 -9L / 00 A 1 -3V -6V -8V

VPB ..../.... ..../ .... -.... / 00 A .... -.... -.... -.... -....



5.14. VPG-VEN+924 Zone Control Valve



Overpressure indicators

Overpressure indicators on progressive feeders make it easier to localize malfunctions when they occur. They are screwed into the upper alternative outlet ports. If the specified lubricant pressure is exceeded in an outlet port equipped with an overpressure indicator, a pin emerges from the front of the indicator, thus pointing out the overpressure. After the fault is remedied, the pin has to be pressed in again by hand.

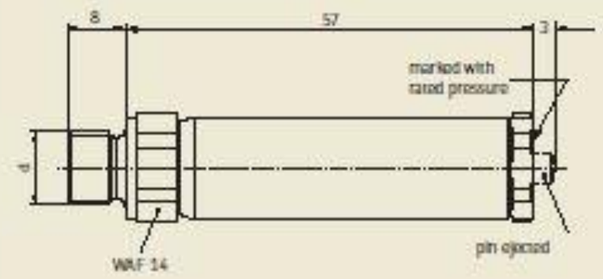
Table 5

Rated pressure [bar]	Order No. with Whitworth tubing threads	d
16	VPG-UE16-2	G1/8A
32	VPG-UE32-2	G1/8A
63	VPG-UE63-2	G1/8A
80	VPG-UE80-2	G1/8A
100	VPG-UE100-2	G1/8A
140	VPG-UE140-2	G1/8A
180	VPG-UE180-2	G1/8A

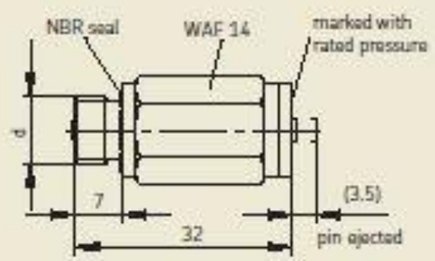
Table 6

Rated pressure [bar]	Order No. with Whitworth tubing threads	d
50	VPG-UE50-3	G1/8A
100	VPG-UE100-3	G1/8A
150	VPG-UE150-3	G1/8A
200	VPG-UE200-3	G1/8A

VP / VPG-...-2

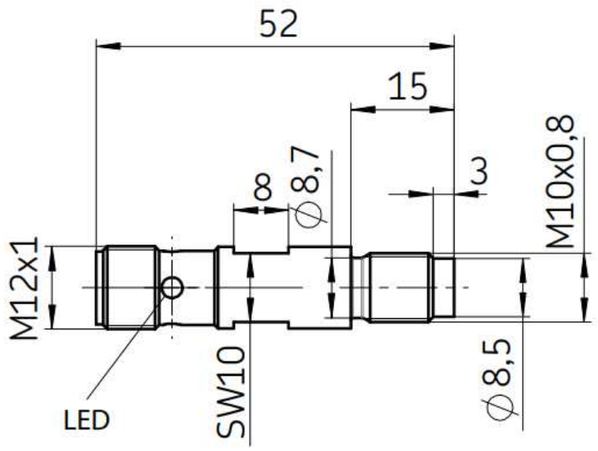


VPM / VPG-...-3



5.16. 24-0159-60** Universal Piston Detector

Dimensioned drawing

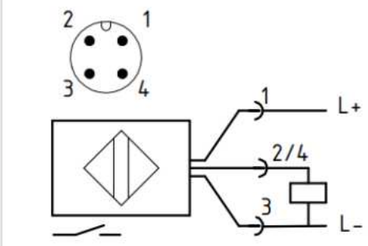


General data		Designation
Field of application		Lubricant metering devices
Ambient temperature	[°C]	–40 ....+85 (234-11454-1 / 234-13163-9) –40 ... +55 (234-13163-9) 1)
Principle of operation		Piston detector/position sensor
Material		Active area stainless steel (1.4404); housing stainless steel (1.4016), plug: PEI
Mounting type		Mountable flush in the associated adapter
Tightening torque	[Nm]	7 ±0.5
Circuit state display	LED	Yellow/lights up on damping
Electrical connection		M12x1 plug-in connection, gold-plated contact

Electrical data		Universal piston detector
Design		3-wire DC PNP 2-wire DC PNP/NPN
Operating voltage	[V]	10-36 DC, supply class 2 per cULus
Max. harmonics	[V]	+/- 10% of max. permissible operating voltage
Power consumption	[mA]	< 5 only in 3-wire operation
Protection class		III
Polarity reversal protection		Yes
Output function		NO contact
Voltage drop	[V]	3.5
Minimum load current	[mA]	5
Residual current	[mA]	< 0.8
Current-carrying capacity	[mA]	100
Short-circuit-proof		Yes
Overload-proof		Yes
Switching frequency	[Hz]	10, with damping surface Ø 4mm to 7 Hz
Enclosure rating	[IP]	IP65 / IP68 / IP69K; with cable box screwed on properly
Immunity to magnetic fields	[mT]	- 0.5 to +0.5

Universal piston detector

Connector pin assignment with cable break protection 3-wire DC PNP



Universal piston detector

Connector pin assignment without cable break protection 2-wire DC PNP/NPN

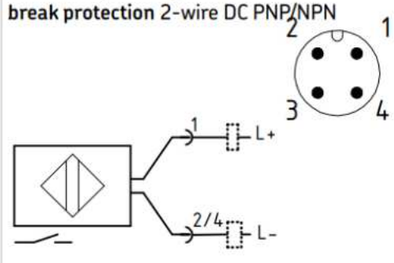


Table 3

Kits with piston detector, O-ring and adapter for lubricant metering devices

Order number	Type Piston detector	for metering devices
24-0159-6025	Universal	VP / PSG2
24-0159-6021	Bipolar	VP / PSG2
24-0159-6024	Universal	VPK / PSG1
24-0159-6022	Bipolar	VPK / PSG1
24-0159-6023	Universal	VPB
24-0159-6028	Bipolar	VPB
24-0159-6026	Universal	PSG3
519-85224-1	Universal	SSV / SSVL / SSVD / SSVDL / VS...*

* For dual-line metering devices series VS..., please contact your local lubrication service team.

5.17. Oil + Air Mixing Valves MV20*-1**-********

Order code **M V _ _ _ – 1 _ _ – _ _ _ _ _ _ _ _**

1 2 3 4 5 6 7 8

Product series

Adjustability of air metering
20 = Adjustable

Number of metering points
1 = 1 metering point
2 = 2 metering points
3 = 3 metering points
4 = 4 metering points
5 = 5 metering points
6 = 6 metering points
7 = 7 metering points
8 = 8 metering points

Seal type
00 = NBR
S8 = FKM (FPM)

Metered quantity (only possible complete or completely without SKF plug connector)
X = Metering point plugged [1]
0 = No metering point available
1 = 0,01 cm³/cycle with counterbore for solderless tube union
2 = 0,02 cm³/cycle with counterbore for solderless tube union
3 = 0,03 cm³/cycle with counterbore for solderless tube union
4 = 0,06 cm³/cycle with counterbore for solderless tube union
5 = 0,10 cm³/cycle with counterbore for solderless tube union
6 = 0,16 cm³/cycle with counterbore for solderless tube union
A = 0,01 cm³/cycle with SKF plug connector
B = 0,02 cm³/cycle with SKF plug connector
C = 0,03 cm³/cycle with SKF plug connector
D = 0,06 cm³/cycle with SKF plug connector
E = 0,10 cm³/cycle with SKF plug connector
F = 0,16 cm³/cycle with SKF plug connector

Dosierstelle 1–8 (0 = nicht vorhanden)

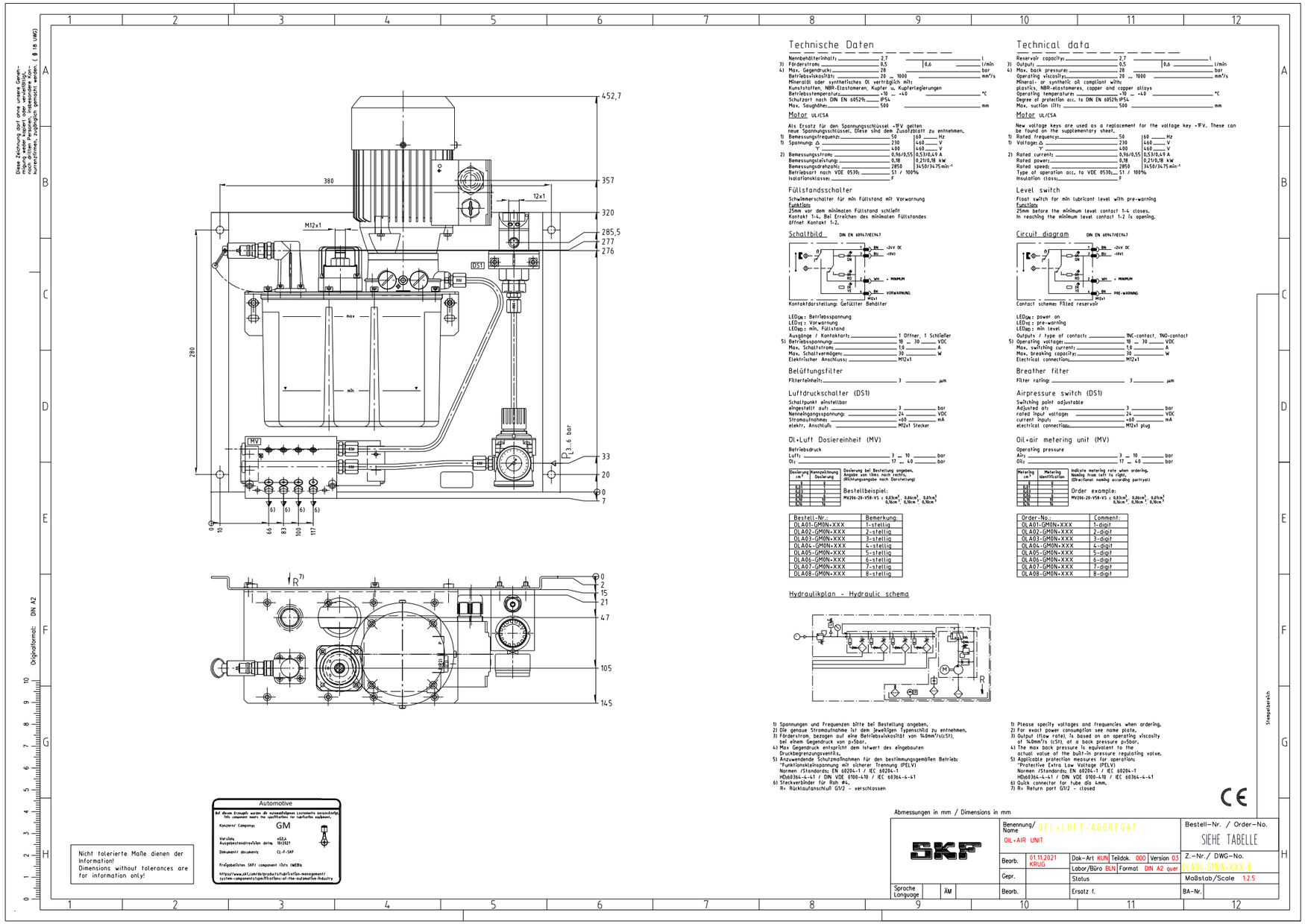
1) without metering point (with a screwed blanking plug)

Order example for MV206-100-AACCFF00

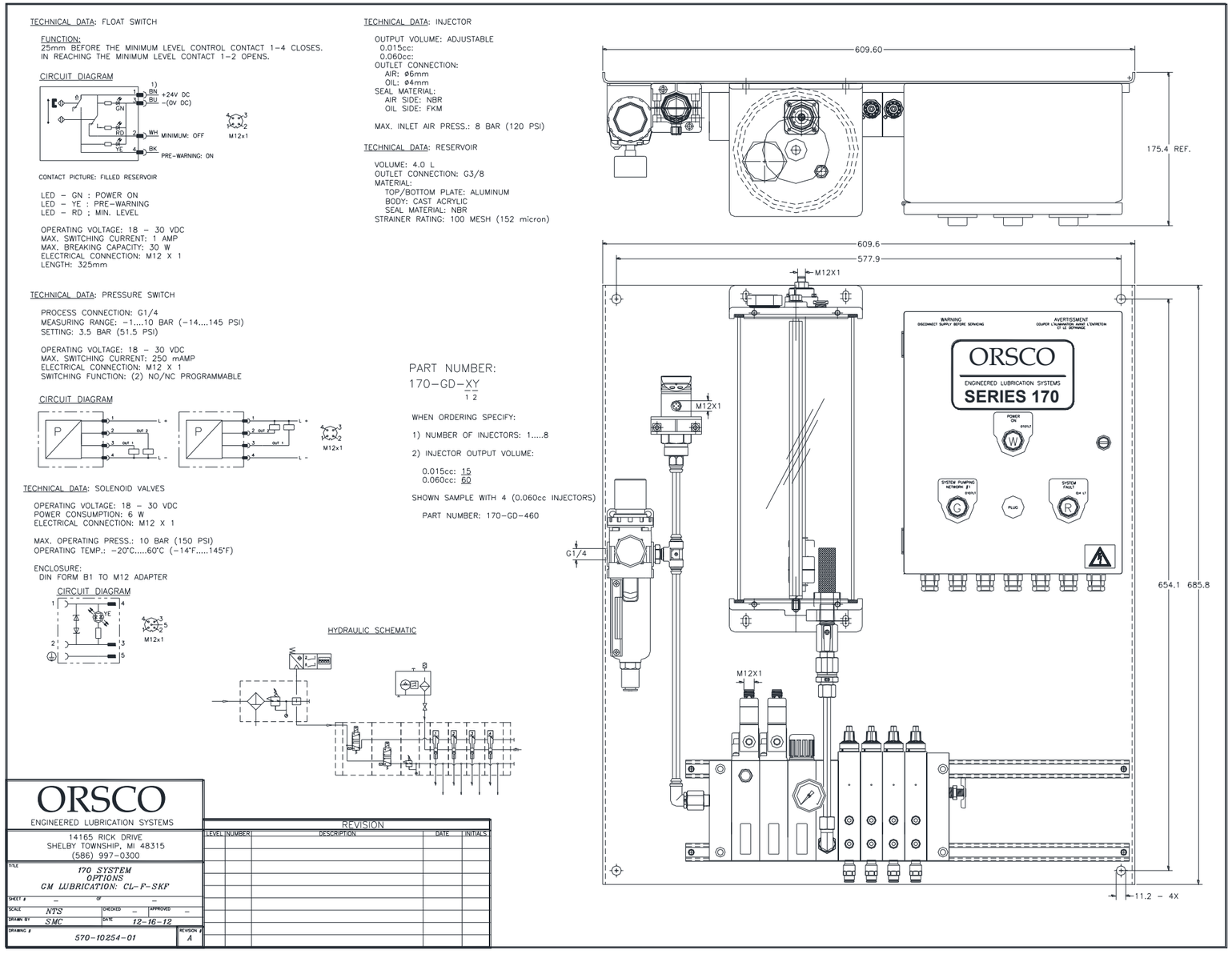
- Product series MV
- Adjustable air metering
- 6 metering points
- Sealing material NBR
- Metering of metering points 1, 2 = 0,01 cm³/cycle with SKF plug connector
- Metering of metering points 3, 4 = 0,03 cm³/cycle with SKF plug connector
- Metering of metering points 5, 6 = 0,16 cm³/cycle with SKF plug connector

MV204-1...

5.18. OLA**-GM0N+*** Oil + Air Units



5.19. Series 170 Oil Spray System for Part Lubrication with Internal Controls

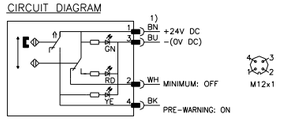


5.20. VSR Oil Spray System for Part Lubrication with External Controls

TECHNICAL DATA: FLOAT SWITCH

FUNCTION:
25mm BEFORE THE MINIMUM LEVEL CONTROL CONTACT 1–4 CLOSES.
IN REACHING THE MINIMUM LEVEL CONTACT 1–2 OPENS.

CIRCUIT DIAGRAM



CONTACT PICTURE: FILLED RESERVOIR

LED – GN : POWER ON
LED – YE : PRE–WARNING
LED – RD ; MIN. LEVEL

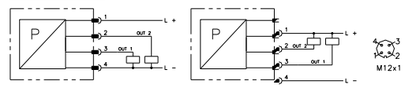
OPERATING VOLTAGE: 18 – 30 VDC
MAX. SWITCHING CURRENT: 1 AMP
MAX. BREAKING CAPACITY: 30 W
ELECTRICAL CONNECTION: M12 X 1
LENGTH: 325mm

TECHNICAL DATA: PRESSURE SWITCH

PROCESS CONNECTION: G1/4
MEASURING RANGE: –1....10 BAR (–14....145 PSI)
SETTING: 3.5 BAR (51.5 PSI)

OPERATING VOLTAGE: 18 – 30 VDC
MAX. SWITCHING CURRENT: 250 mAMP
ELECTRICAL CONNECTION: M12 X 1
SWITCHING FUNCTION: (2) NO/NC PROGRAMMABLE

CIRCUIT DIAGRAM



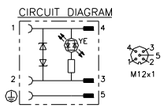
TECHNICAL DATA: SOLENOID VALVES

OPERATING VOLTAGE: 18 – 30 VDC
POWER CONSUMPTION: 6 W
ELECTRICAL CONNECTION: M12 X 1

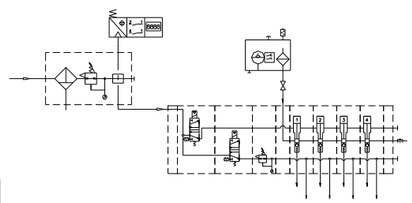
MAX. OPERATING PRESS.: 10 BAR (150 PSI)
OPERATING TEMP.: –20°C.....60°C (–14°F.....145°F)

ENCLOSURE:
DIN FORM B1 TO M12 ADAPTER

CIRCUIT DIAGRAM



HYDRAULIC SCHEMATIC



TECHNICAL DATA: INJECTOR

OUTPUT VOLUME: ADJUSTABLE
0.015cc:
0.060cc:
OUTLET CONNECTION:
AIR: ø6mm
OIL: ø4mm
SEAL MATERIAL:
AIR SIDE: NBR
OIL SIDE: FKM

MAX. INLET AIR PRESS.: 8 BAR (120 PSI)

TECHNICAL DATA: RESERVOIR

VOLUME: 4.0 L
OUTLET CONNECTION: G3/8
MATERIAL:
TOP/BOTTOM PLATE: ALUMINUM
BODY: CAST ACRYLIC
SEAL MATERIAL: NBR
STRAINER RATING: 100 MESH (152 micron)

PART NUMBER:
VSR–GD–XY
1 2

WHEN ORDERING SPECIFY:

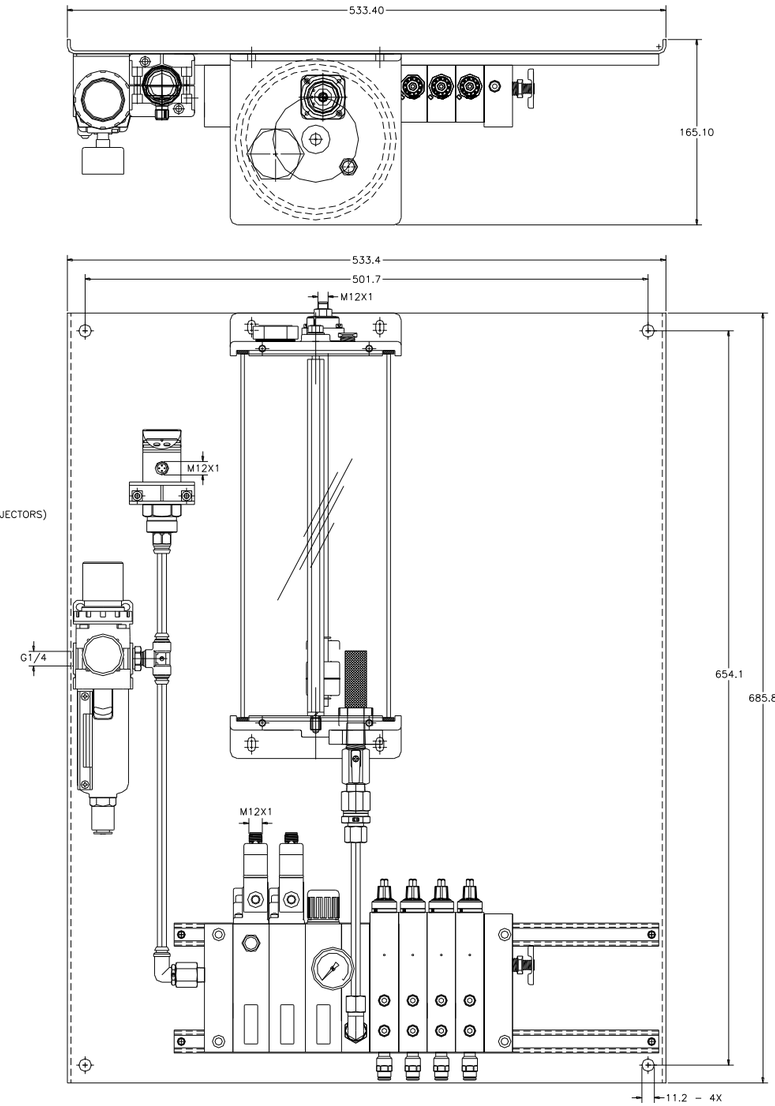
1) NUMBER OF INJECTORS: 1.....8

2) INJECTOR OUTPUT VOLUME:

0.015cc: 15
0.060cc: 60

SHOWN SAMPLE WITH 4 (0.060cc INJECTORS)

PART NUMBER: VSR–GD–460



ORSCO
ENGINEERED LUBRICATION SYSTEMS
14165 RICK DRIVE
SHELBY TOWNSHIP, MI 48315
(586) 997–0300

TITLE: VSR SYSTEM OPTIONS CM LUBRICATION: CL–F–SKF
SHEET # – OF –
SCALE FULL CHECKED – APPROVED –
DRAWN BY SMC DATE 12–16–12
DRAWING # 570–10254–02 REVISION # A

REVISION

LEVEL	NUMBER	DESCRIPTION	DATE	INITIALS

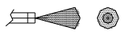
5.21. LGPTN Oil + Air Spray Nozzle Assemblies

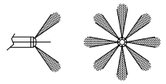
SPRAY NOZZLE ASSEMBLIES FOR PART LUBRICATION

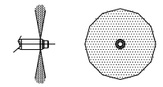
LGTPN–X–NY–XX–XXX, (1 2 3 4) LGTCN–X–NY–XX–XXX, (1 2 3 4) LGTFN–X–NY–XX–XXX (1 2 3 4)

WHEN ORDERING SPECIFY:

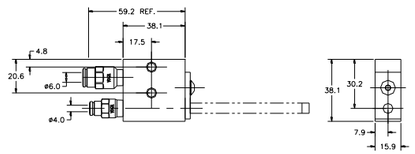
1) SPRAY TYPE:

PINPOINT: LGTPN 

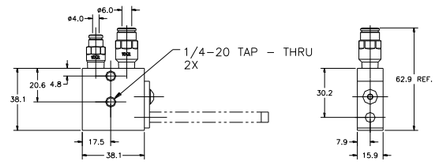
CONE: LGTCN 

FAN: LGTFN 

2) BODY STYLE: "X"



IN–LINE: IL

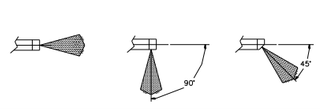


LOW PROFILE: LP

3) SPRAY ANGLE: "XX"

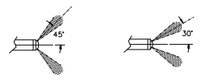
PINPOINT: LGTPN

0°: 00 45°: 45 90°: 90



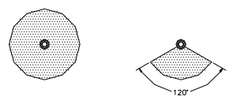
CONE: LGTCN

45°: 45 30°: 30



FAN: LGTFN

360°: 360 120°: 120



TECHNICAL DATA:
- AIR CONNECTION: ø6mm
- OIL CONNECTION: ø4mm
- OIL LINE PRESSURE: 5–7 BAR (70–100 PSI)
- AIR LINE PRESSURE: 0.3–1.1 BAR (4.5–16 PSI)
- FITTING MATERIAL: BRASS

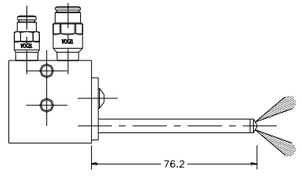
- NOZZLE BODY MATERIAL: ALUMINUM
- NOZZLE TIP MATERIAL: 303/304 SS
- SEAL MATERIAL: VITON
- TEMP. RANGE: –26°C TO 80°C (–15°F TO 176°F)

4) TIP LENGTH: "XXX"

STANDARD LENGTHS:
- 25.4 mm: 1
- 50.8 mm: 2
- 76.2 mm: 3

EXAMPLE:
CONE SPRAY, LOW–PROFILE BODY, 30° SPRAY, 76.2mm LG. TIP

PART #: LGTCN–LP–NY–30–3

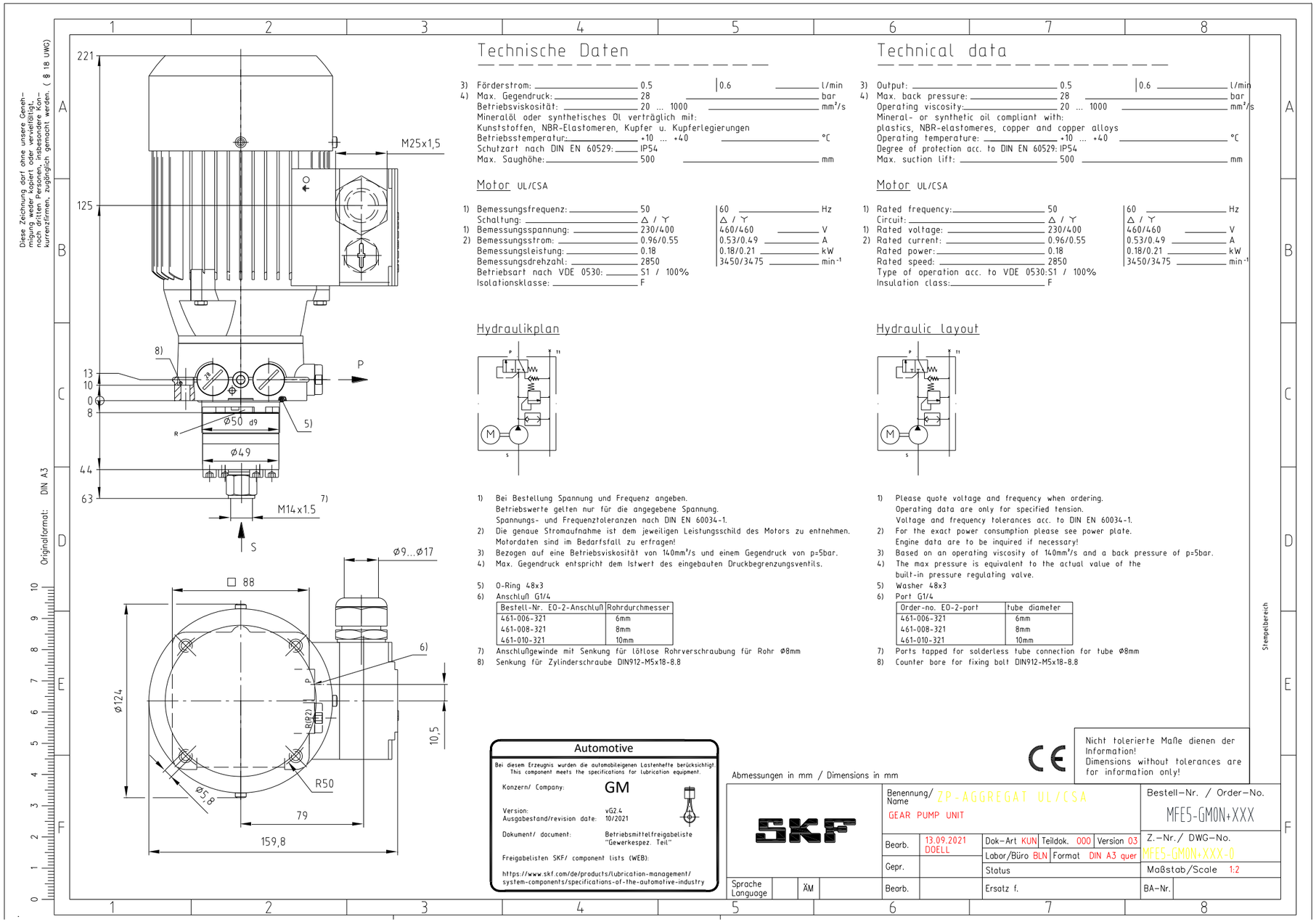


ORSCO
ENGINEERED LUBRICATION SYSTEMS
14165 RICK DRIVE
SHELBY TOWNSHIP, MI 48315
(586) 997–0300

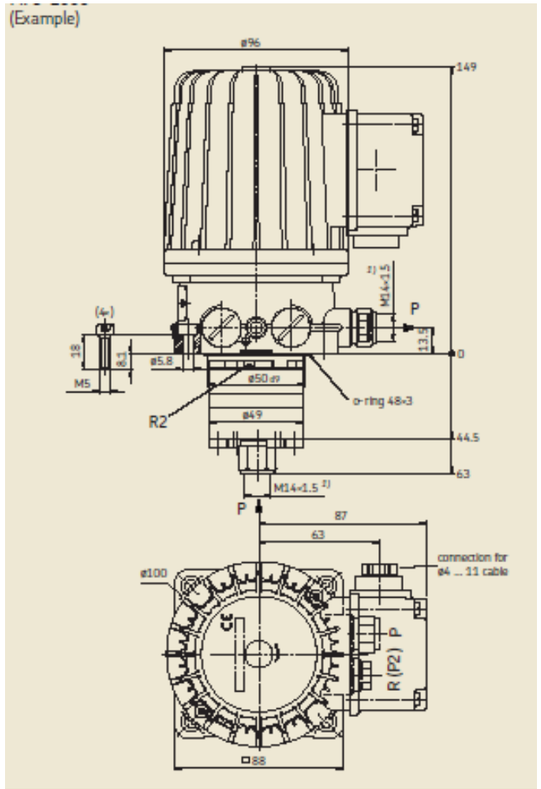
TITLE: SPRAY NOZZLE OPTIONS GM LUBRICATION: CL–F–SKF
SHEET # – OF –
SCALE NTS CHECKED – APPROVED –
DRAWN BY SMC DATE 12–16–12
DRAWING # 570–10254–03 REVISION # A

REVISION				
LEVEL	NUMBER	DESCRIPTION	DATE	INITIALS

5.22. MFE5-GM0N+1GD Gear Pump for Oil



5.23. FLMF Vane Cell Pumps



Vane cell pumps									
FLM12-2000	FLMF12-2000	1.2	6	20 - 850	3000	0.075	2700	0.5/0.29	M16×1.5
FLM24-2000	FLMF24-2000	2.4	3	20 - 500	1000	0.075	2700	0.5/0.29	M16×1.5

5.24. 143-1******-**+*** Gerotor Pumps

Gerotor pump unit in foot design

Gerotor pump unit in flange design

Gerotor pump

Technical data

Flow rate range	0.85 to 50 l/min
Pressure, max.	50 bar
Pumped medium	Lubricating and hydraulic oils
Operating viscosity	20 to 1000 mm²/s
Drive speed depending on design	1400 and 2800 rpm
Protection class acc. to DIN EN 40050	IP54
Duty type per VDE 0530	S1
Ambient temperature range	0 to +40 °C
Pumped medium temperature range	0 to +80 °C
Sealing material	NBR, FKM (FPM)
Suction head, max.	1000 mm
Operating noise level	Max. 60 dBA
Varnishing	RAL 7024 graphite gray, special varnish available on customer request

Materials

Pump housing	Hydraulic cast (pressure-tight) with good wear and antifrictional properties
Tooth ring insert	Sintered material
Shafts	Low-deformation case-hardened steels
Bearing	SKF plain bearing

General notes on usage

During commissioning, pay attention to the pump's direction of rotation. See the rating plate and motor rotation arrow on the pump.

If using the pumps in systems without any open pressure lines, provide pressure-regulating valves to limit the maximum pressure of the system.

The selected cross-section of the intake tube must be equal to or greater than the cross-section of the pump's suction port.

SKF Lubrication Systems Germany AG recommends the use of filters for trouble-free operation of the pumps or pump units. Effective filtration prevents malfunctions while also increasing the service life of the pumps. A pumped medium of at least the purity class 20/17/14 according to ISO 4406(c) is recommended. This corresponds to the U.S. standard NAS code (1638) class 8 and SAWAS 4059 class 8. A filter rating of approx. 5 - 10 µm meets this requirement. The filter rating used is always based on the most sensitive component in the entire system. This is not necessarily the pump.

Order code

Order code: 1 4 3 – 1 _ _ _ _ _ – _ _ + _ _ _

- Product series 143
- A Model design
- B Seal design
- C Code for pump design [1]
- Voltage code F
- Motor certification E
- Terminal box position D

Model design (A)

1		Motor in foot design (IMB34)
2		Motor in flange design (IMB14)
3		Gerotor pump+pump flange+shaft coupling (without motor)
4		Only gerotor pump (without motor)

Seal design (B)

N		NBR
F		FKM (FPM)

Terminal box position as seen from shaft extension of drive side (not applicable on design without motor) (D)

R		Right (standard, not on motor 1.1; 1.5, and 4 kW)
O		Top (standard on motor 1.1, 1.5, and 4 kW), right not supported
X		On motor in flange design (IMB14), Terminal box position on suction port side of pump

(others available on request)

Motor certification (E)

Not applicable on design without motor

A		CE (Europe)
B		UL/CSA (USA/Canada)

(others available on request)

Voltage code (F)

Not applicable on designs without motor

XXX		

Voltage code See page 16.

Code for pump design (C)

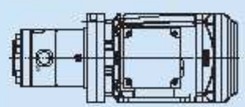
Code[1]	Nominal delivery rate[2] [l/min]	Back pressure max. [bar]	Motor drive power [kW]	Permissible operating viscosity range [mm²/s]	Size	Number of poles
B03C	0.85	30	0.18	20-1000	63	4
D03E	1.7	30	0.37	20-1000	71	2
F02D	2.5	20	0.25	20-1000	71	4
F05F	2.5	50	0.55	20-1000	80	4
H02F	5.25	20	0.55	20-1000	80	4
H05J	5.25	50	1.1	20-1000	90	4
K02H	9	20	0.75	20-1000	80	4
K05J	9	50	1.1	20-1000	90	4
M02H	12.5	20	0.75	20-1000	80	4
M05K	12.5	50	1.5	20-1000	90	4
P02K	19	20	1.5	20-1000	90	4
R02M	30	20	3	20-1000	100	2
R03M	30	30	3	20-750	100	2
R03N	30	30	4	20-1000	112	2
T02M	40	20	3	20-750	100	2
T03N	40	30	4	20-1000	112	2
V02N	50	20	4	20-1000	112	2
V03N	50	30	4	20-750	112	2
V03P	50	30	5.5	20-1000	132	2

[1] For model design 4 delete item 4 of the code for the pump design.
[2] Nominal delivery rate at motor speed 1400/2800 rpm acc. to number of motor pins.

Order example

143-11ND03E-RA+1FX

- Gerotor pump unit Product series 143
- Motor in foot design
- Sealing NBR
- Nominal delivery rate 1.7 l/min
- Back pressure 30 bar
- Motor index 0.37 kW
- Terminal box on right
- Motor certification CE
- 220–240 V / 380–420V, 50 Hz 254–280 V / 440–480V, 60 Hz



D – F is not applicable if ordering the gerotor pump+pump flange+shaft coupling (model design 3)
Example: **143-13ND03E**

D – F and item 4 of the code for the pump design are not applicable if ordering the gerotor pump (model design 4)
Example: **143-14ND03**

5.25. P-886 Pneumatic Pump

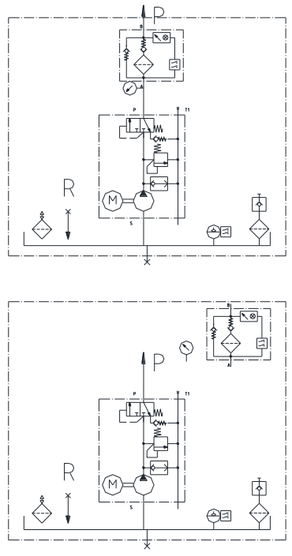
Technical data

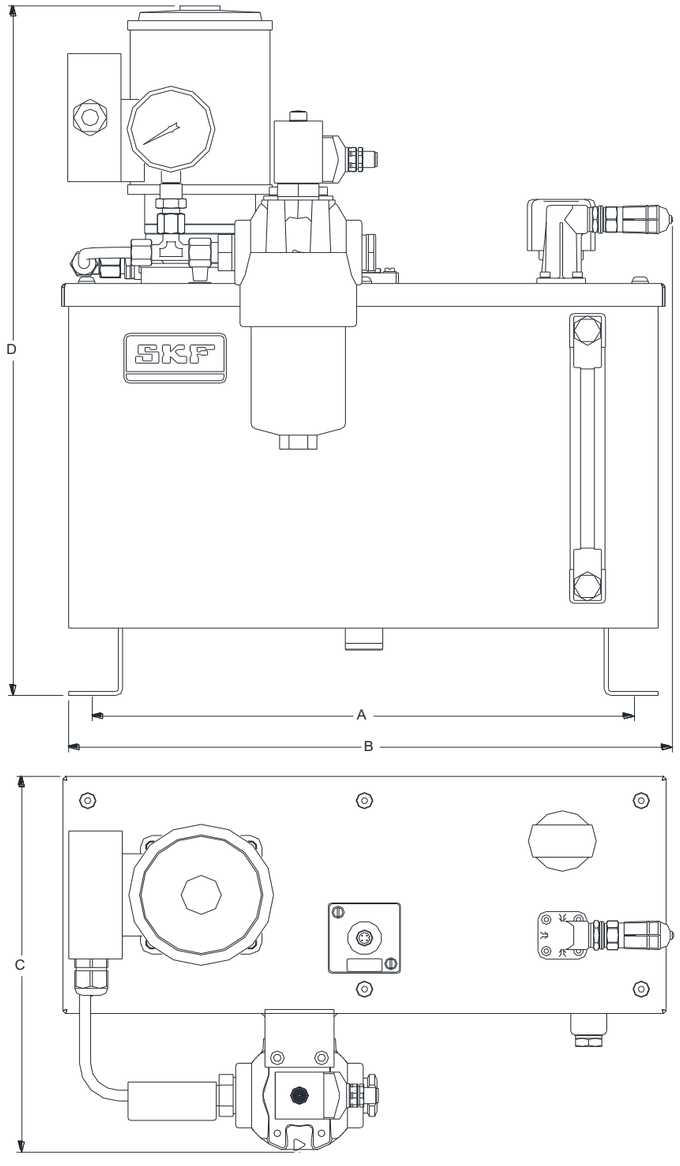
Order number	**P-886**
Function principle	air or hydraulically operated piston pump
Outlets	1
Metering quantity	30 cm³/stroke, *1.8 in³/stroke*
Lubricant	mineral or synthetic oils, compliant with plastic, NBR-elastomeres, cooper and copper alloys
Operating temperature	10 to +40 °C *50 to +104 °F*
Operating pressure	max. 35 bar, *max. 508 psi*
Actuation pressure	4–10 bar, *58–145 psi*
Reservoir	external
Connection outlet	M14×1,5 (for tube Ø8 mm)
Connection inlet	M16×1,5 (for tube Ø10 mm)
Air inlet connection	G¼ (for tube Ø8 mm)
Return valve connection outlet	M10×1 (for tube Ø6 mm)
Protection class	IP 54
Dimensions	108 × 219 × 108 mm *4.25 × 8.62 × 4.25 in*
Mounting position	any

5.26. MFE5 – Gear Pump Units for Oil with Reservoir

North America	Europe	China
Metal Reservoir Units		
MFE5-BW3-GM0N+1GD	MFE5-BW3-GM0E+1GD	MFE5-BW3-GM0A+1FW
MFE5-BW7-GM0N+1GD	MFE5-BW7-GM0E+1GD	MFE5-BW7-GM0A +1FW
MFE5-BW16-GM0N +1GD	MFE5-BW16-GM0E +1GD	MFE5-BW16-GM0A +1FW
MFE5-BW30- GM0N +1GD	MFE5-BW30-GM0E +1GD	MFE5-BW30-GM0A +1FW
Plastic Reservoir Units		
MFE5-KW3-GM0N +1GD	MFE5-KW3-GM0E +1GD	MFE5-KW3-GM0A +1FW
MFE5-KW3-GM0N +1GD	MFE5-KW3-GM0E +1GD	MFE5-KW3-GM0A +1FW

NOTE: +1GP voltage code refers to motors: CE, UL, CSA certified
220/380 V, 50 Hz / 440 V, 60 Hz
+1GD voltage code refers to motors: CE, UL, CSA certified
230/400 V, 50 Hz / 460 V, 60 Hz
+1GQ voltage code refers to motors: CE, UL, CSA certified
240/415 V, 50 Hz / 480 V, 60 Hz
+1FW voltage code refers to single range motors: CCC certified
220 / 380 V, 50 Hz ±10%

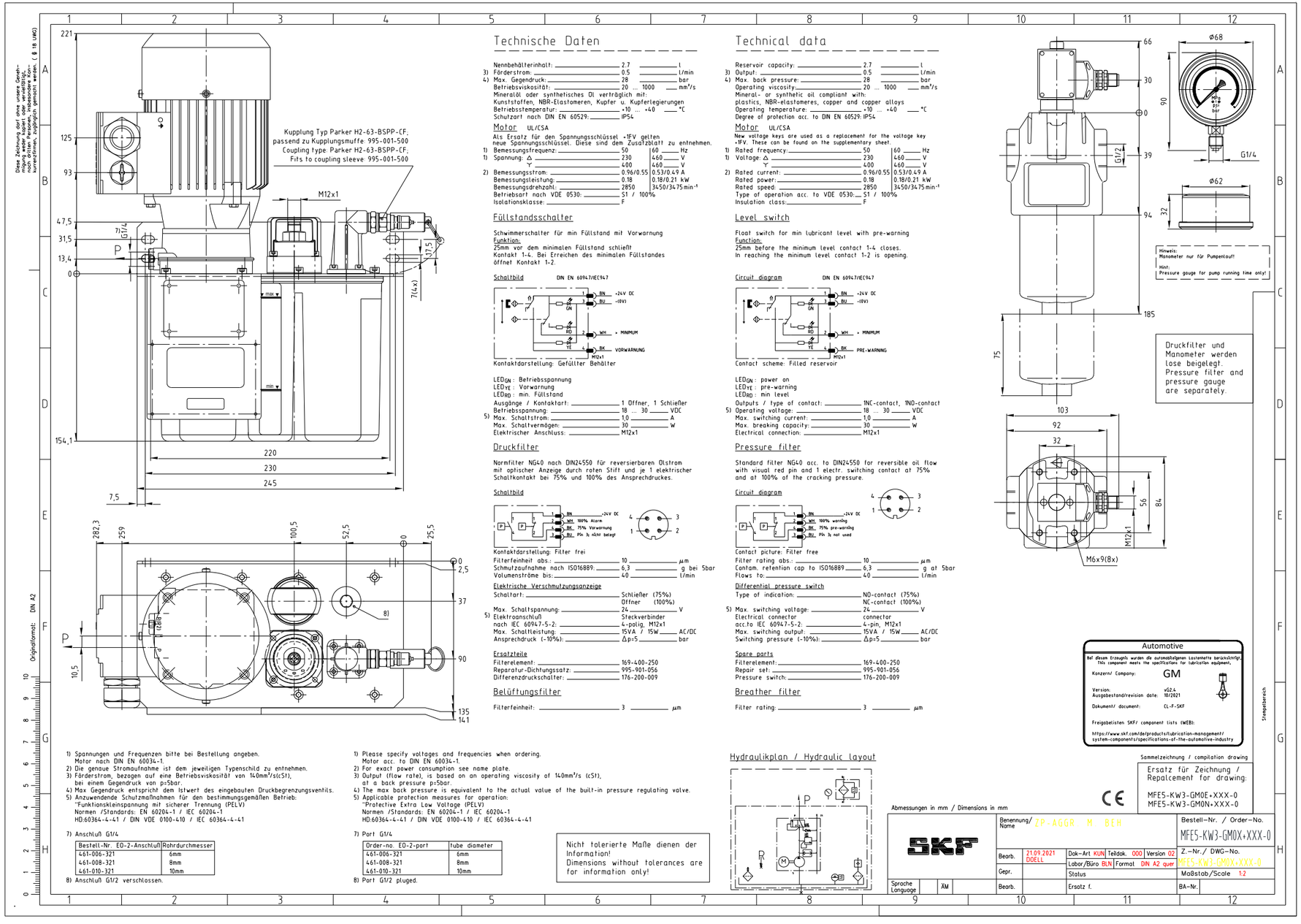




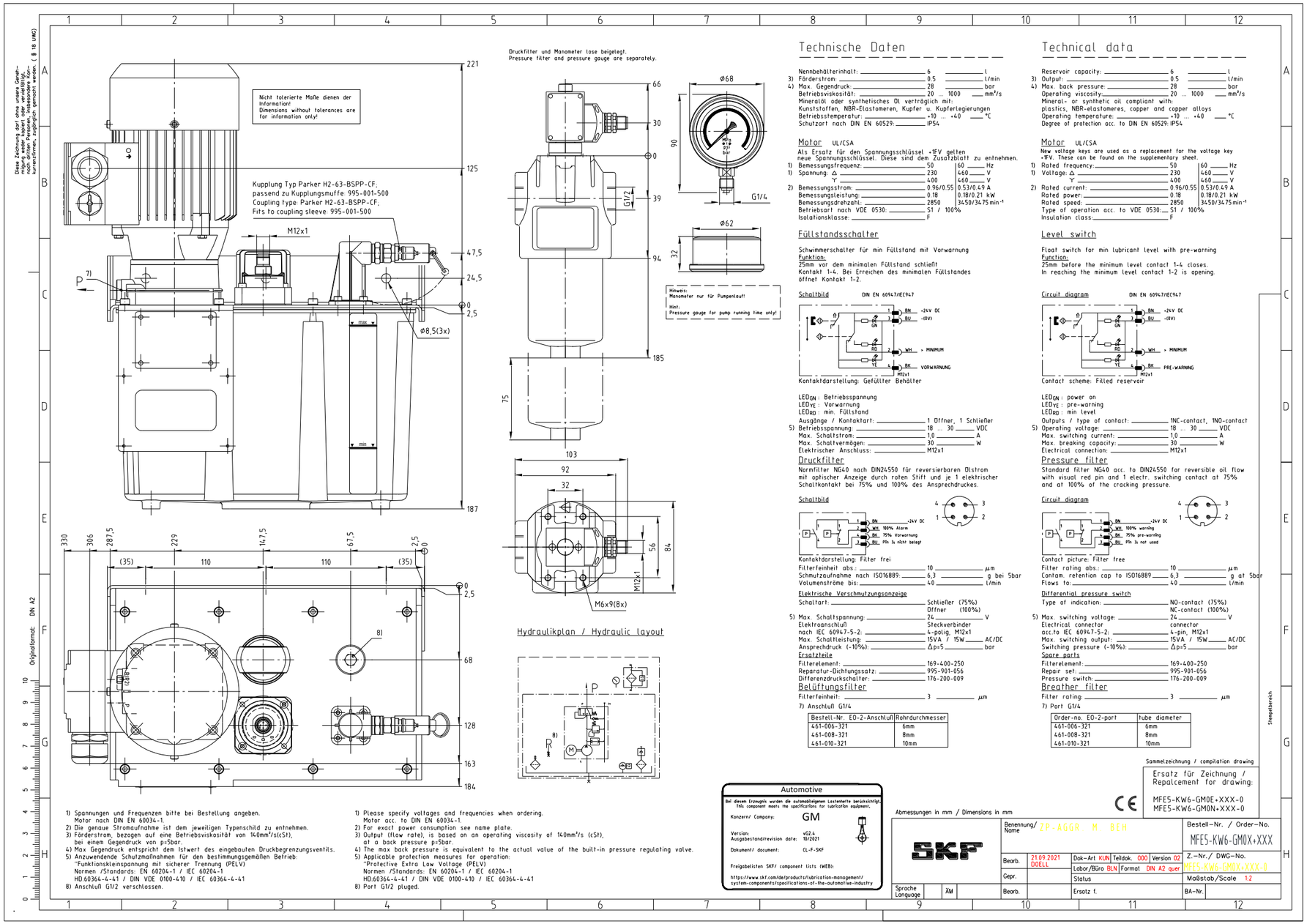
Standard Dimensions for Pump Units

Part Number	A	B	C	D
MFE5-BW3-GM0*	220x110	240	170	395
MFE5-BW7-GM0*	300x140	320	220	445
MFE5-BW16-GM0*	400x124	430	305	525
MFE5-BW30-GM0*	430x240	500	380	615

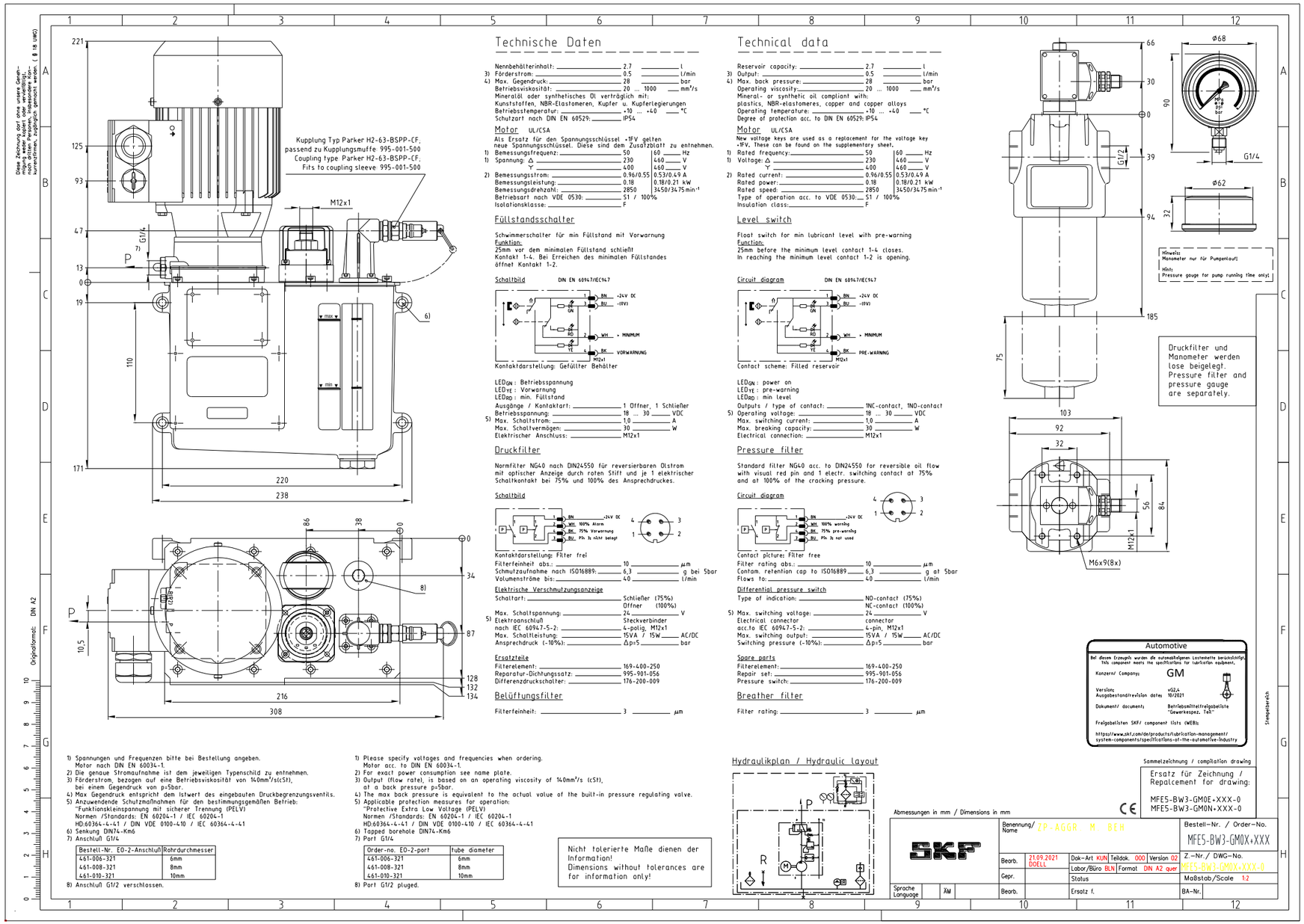
5.27. MFE5-KW3-GM0N+1GD



5.28. MFE5-KW6-GM0N+1GD



5.29. MFE5-BW3-GM0N+1GD



Technische Daten

	Nennbehälterinhalt:	2.7	l
3)	Förderstrom:	0.5	l/min
4)	Max. Gegendruck:	28	bar
	Betriebsviskosität:	20 ... 1000	mm²/s
	Mineralöl oder synthetisches Öl verträglich mit: Kunststoffen, NBR-Elastomeren, Kupfer u. Kupferlegierungen		
	Betriebstemperatur:	-10 ... +40	°C
	Schutzart nach DIN EN 60529:	IP54	

Motor UL/CSA

Als Ersatz für den Spannungsschlüssel -1FV gelten neue Spannungsschlüssel. Diese sind dem Zusatzblatt zu entnehmen.

1)	Bemessungsfrequenz:	50	60 Hz
1)	Spannung: Δ	230	460 V
	Y	400	460 V
2)	Bemessungsstrom:	0.96/0.55	0.53/0.49 A
	Bemessungsleistung:	0.18	0.18/0.21 kW
	Bemessungsdrehzahl:	2850	3450/3475 min⁻¹
	Betriebsart nach VDE 0530:	S1 / 100%	
	Isolationsklasse:	F	

Füllstandsschalter

Schwimmerschalter für min Füllstand mit Vorwarnung
Funktion:
25mm vor dem minimalen Füllstand schließt Kontakt 1-4. Bei Erreichen des minimalen Füllstandes öffnet Kontakt 1-2.

Schaltbild DIN EN 60947/IEC947

Kontaktdarstellung: Gefüllter Behälter

LED_{GN} : Betriebsspannung
LED_{YE} : Vorwarnung
LED_{RD} : min. Füllstand

	Ausgänge / Kontaktart:	1 Öffner, 1 Schließer	
	Betriebsspannung:	18 ... 30	VDC
5)	Max. Schaltstrom:	1,0	A
	Max. Schaltvermögen:	30	W
	Elektrischer Anschluss:	M12x1	

Druckfilter

Normfilter NG40 nach DIN24550 für reversierbaren Ölstrom mit optischer Anzeige durch roten Stift und je 1 elektrischer Schaltkontakt bei 75% und 100% des Ansprechdruckes.

Schaltbild

Kontaktdarstellung: Filter frei

	Filterfeinheit abs.:	10	µm
	Schmutzaufnahme nach ISO16889:	6,3	g bei 5bar
	Volumenströme bis:	40	l/min

Elektrische Verschmutzungsanzeige

	Schaltart:	Schließer (75%) Öffner (100%)	
	Max. Schaltspannung:	24	V
5)	Elektroanschluß nach IEC 60947-5-2:	Steckverbinder 4-polig, M12x1	
	Max. Schaltleistung:	15VA / 15W	AC/DC
	Ansprechdruck (-10%):	Δp=5	bar

Ersatzteile

Filterelement:	169-400-250
Reparatur-Dichtungssatz:	995-901-056
Differenzdruckschalter:	176-200-009

Belüftungsfilter

Filterfeinheit: 3 µm

Technical data

	Reservoir capacity:	2.7	l
3)	Output:	0.5	l/min
4)	Max. back pressure:	28	bar
	Operating viscosity:	20 ... 1000	mm²/s
	Mineral- or synthetic oil compliant with: plastics, NBR-elastomeres, copper and copper alloys		
	Operating temperature:	-10 ... +40	°C
	Degree of protection acc. to DIN EN 60529:	IP54	

Motor UL/CSA

New voltage keys are used as a replacement for the voltage key -1FV. These can be found on the supplementary sheet.

1)	Rated frequency:	50	60 Hz
1)	Voltage: Δ	230	460 V
	Y	400	460 V
2)	Rated current:	0.96/0.55	0.53/0.49 A
	Rated power:	0.18	0.18/0.21 kW
	Rated speed:	2850	3450/3475 min⁻¹
	Type of operation acc. to VDE 0530:	S1 / 100%	
	Insulation class:	F	

Level switch

Float switch for min lubricant level with pre-warning
Function:
25mm before the minimum level contact 1-4 closes. In reaching the minimum level contact 1-2 is opening.

Circuit diagram DIN EN 60947/IEC947

Contact scheme: Filled reservoir

LED_{GN} : power on
LED_{YE} : pre-warning
LED_{RD} : min level

	Outputs / type of contact:	1NC-contact, 1NO-contact	
5)	Operating voltage:	18 ... 30	VDC
	Max. switching current:	1,0	A
	Max. breaking capacity:	30	W
	Electrical connection:	M12x1	

Pressure filter

Standard filter NG40 acc. to DIN24550 for reversible oil flow with visual red pin and 1 electr. switching contact at 75% and at 100% of the cracking pressure.

Circuit diagram

Contact picture: Filter free

	Filter rating abs.:	10	µm
	Contam. retention cap to ISO16889	6,3	g at 5bar
	Flows to:	40	l/min

Differential pressure switch

	Type of indication:	NO-contact (75%) NC-contact (100%)	
5)	Max. switching voltage:	24	V
	Electrical connector acc.to IEC 60947-5-2:	connector 4-pin, M12x1	
	Max. switching output:	15VA / 15W	AC/DC
	Switching pressure (-10%):	Δp=5	bar

Spare parts

Filterelement:	169-400-250
Repair set:	995-901-056
Pressure switch:	176-200-009

Breather filter

Filter rating: 3 µm

1) Spannungen und Frequenzen bitte bei Bestellung angeben. Motor nach DIN EN 60034-1.
2) Die genaue Stromaufnahme ist dem jeweiligen Typenschild zu entnehmen.
3) Förderstrom, bezogen auf eine Betriebsviskosität von 140mm²/s(cSt), bei einem Gegendruck von p=5bar.
4) Max Gegendruck entspricht dem Istwert des eingebauten Druckbegrenzungsventils.
5) Anzuwendende Schutzmaßnahmen für den bestimmungsgemäßen Betrieb: "Funktionskleinspannung mit sicherer Trennung (PELV) Normen /Standards: EN 60204-1 / IEC 60204-1 HD:60364-4-41 / DIN VDE 0100-410 / IEC 60364-4-41
6) Senkung DIN74-Km6
7) Anschluß G1/4

Bestell-Nr. EO-2-Anschluß	Rohrdurchmesser
461-006-321	6mm
461-008-321	8mm
461-010-321	10mm

8) Anschluß G1/2 verschlossen.

1) Please specify voltages and frequencies when ordering. Motor acc. to DIN EN 60034-1.
2) For exact power consumption see name plate.
3) Output (flow rate), is based on an operating viscosity of 140mm²/s (cSt), at a back pressure p=5bar.
4) The max back pressure is equivalent to the actual value of the built-in pressure regulating valve.
5) Applicable protection measures for operation: "Protective Extra Low Voltage (PELV) Normen /Standards: EN 60204-1 / IEC 60204-1 HD:60364-4-41 / DIN VDE 0100-410 / IEC 60364-4-41
6) Tapped borehole DIN74-Km6
7) Port G1/4

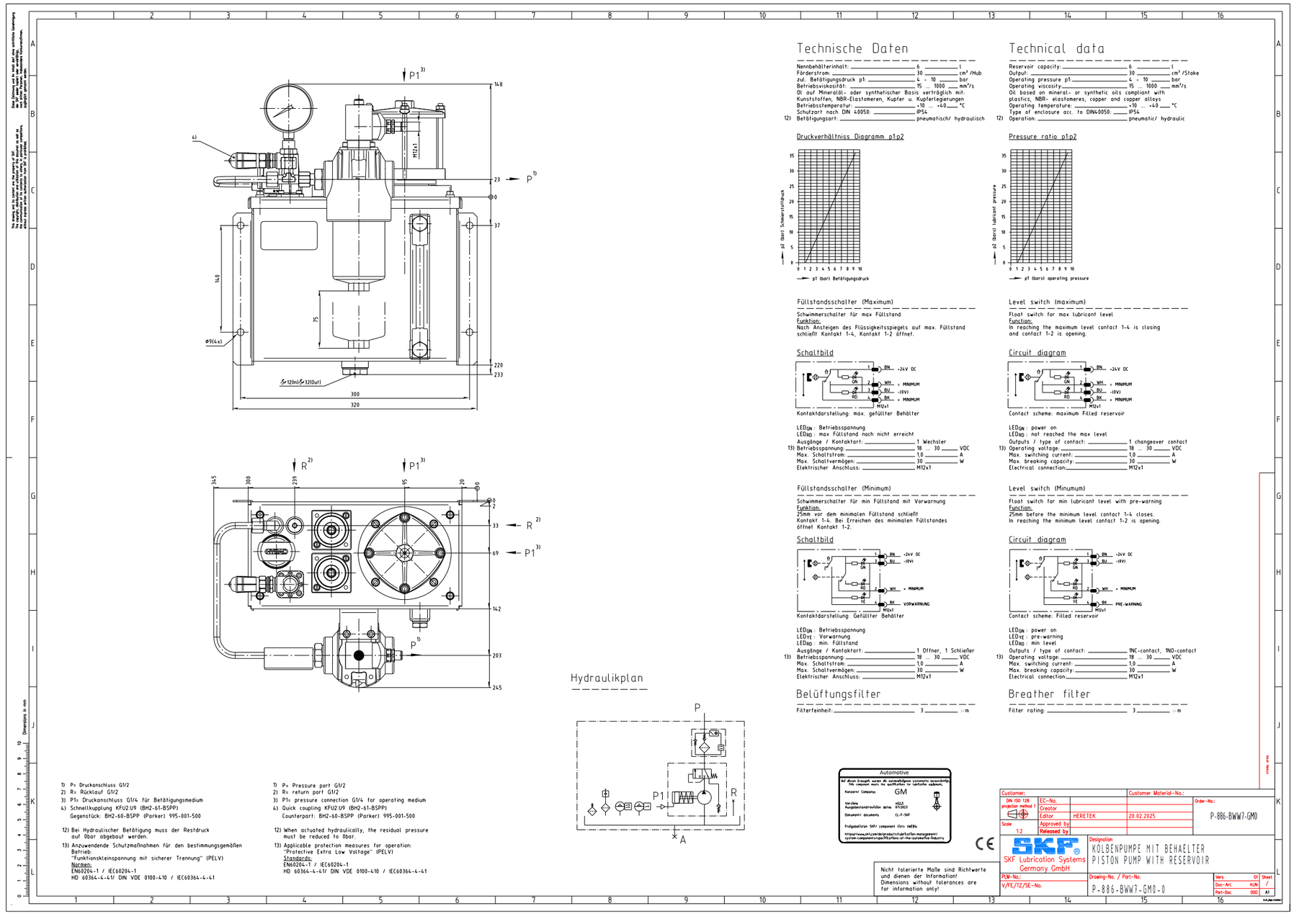
Order-no. EO-2-port	tube diameter
461-006-321	6mm
461-008-321	8mm
461-010-321	10mm

8) Port G1/2 pluged.

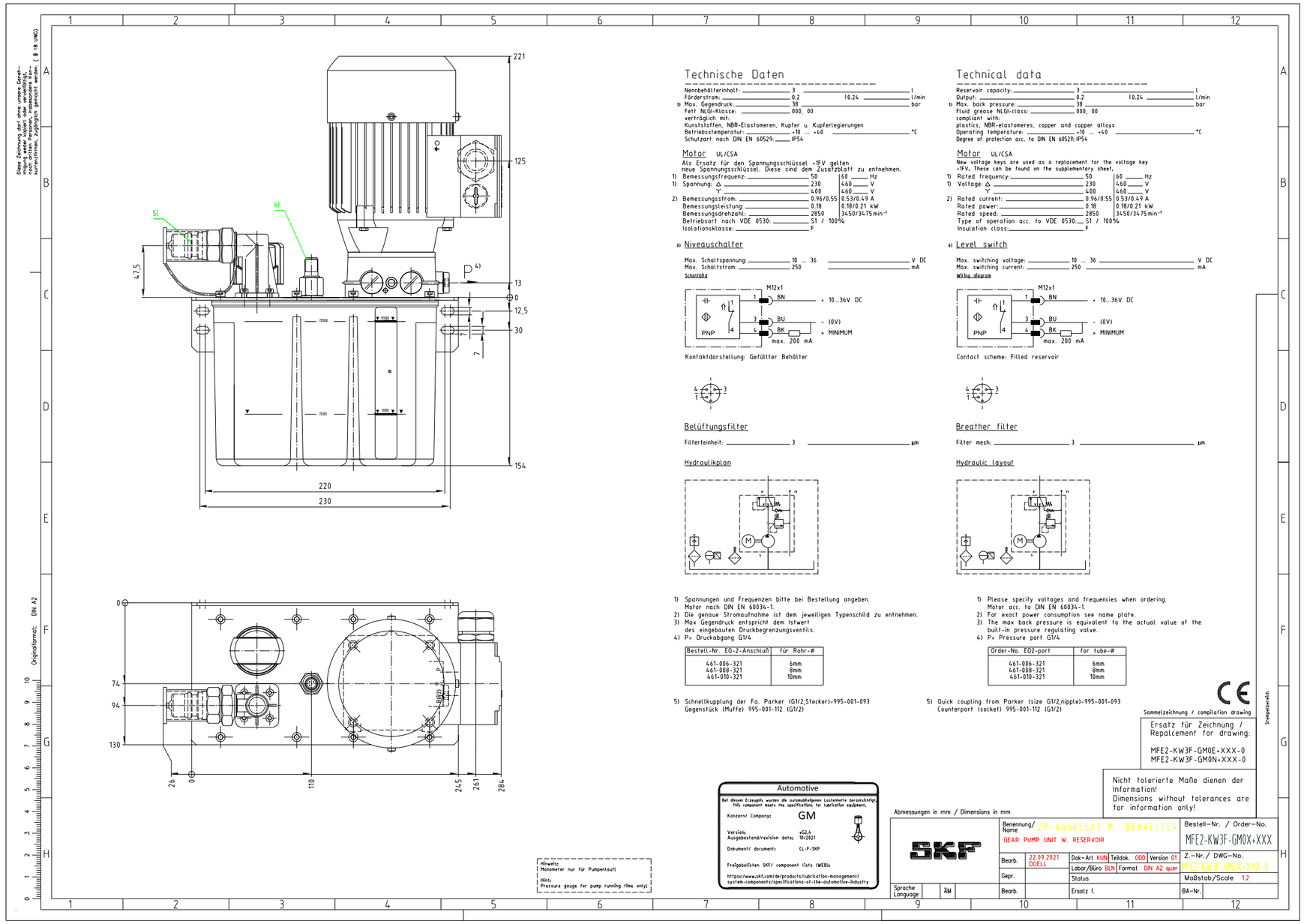
Nicht tolerierte Maße dienen der Information!
Dimensions without tolerances are for information only!

Hydraulikplan / Hydraulic layout

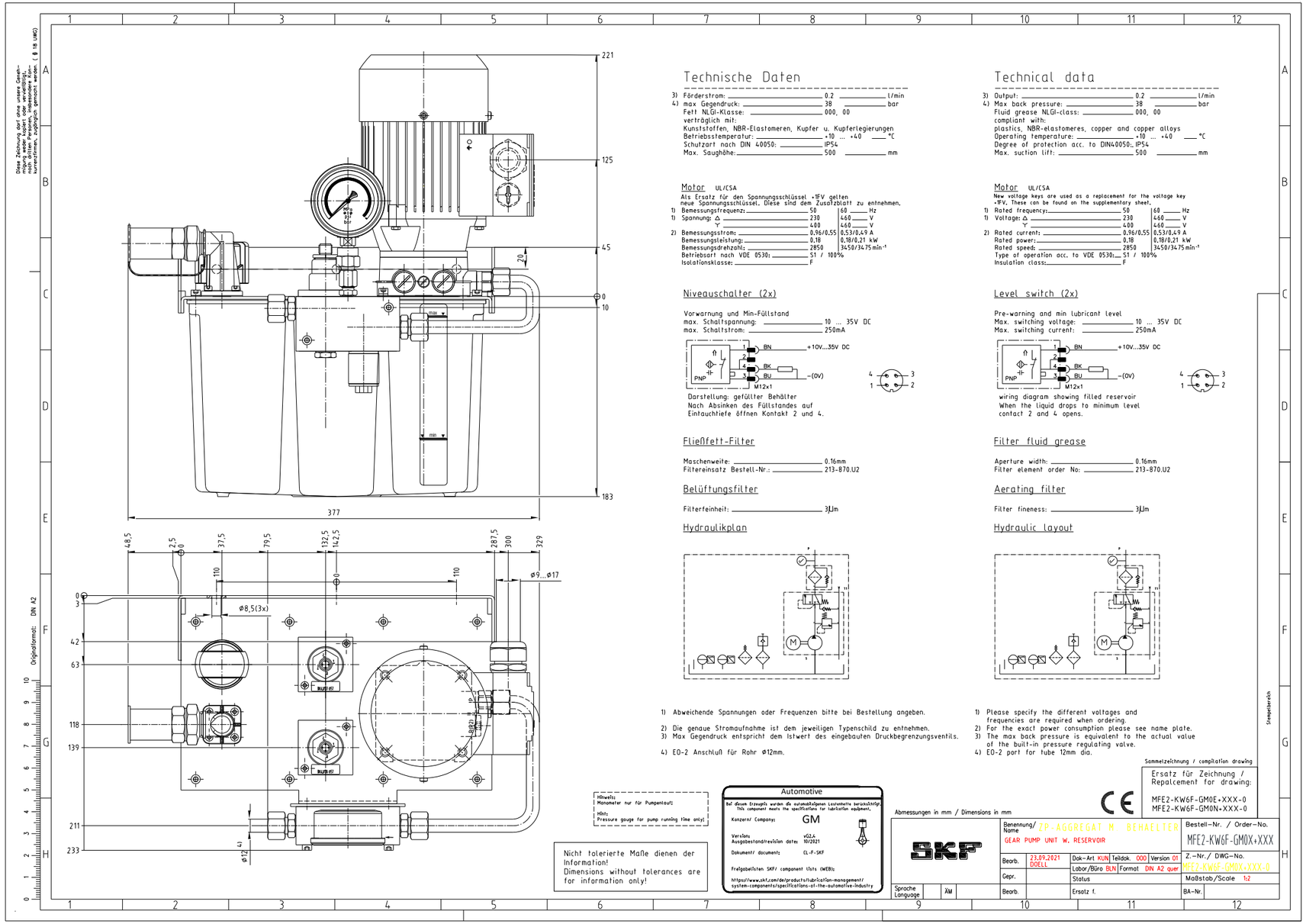
5.30. P-886-BWW7-GM0 Pneumatically Operated Piston Pumps for Oil



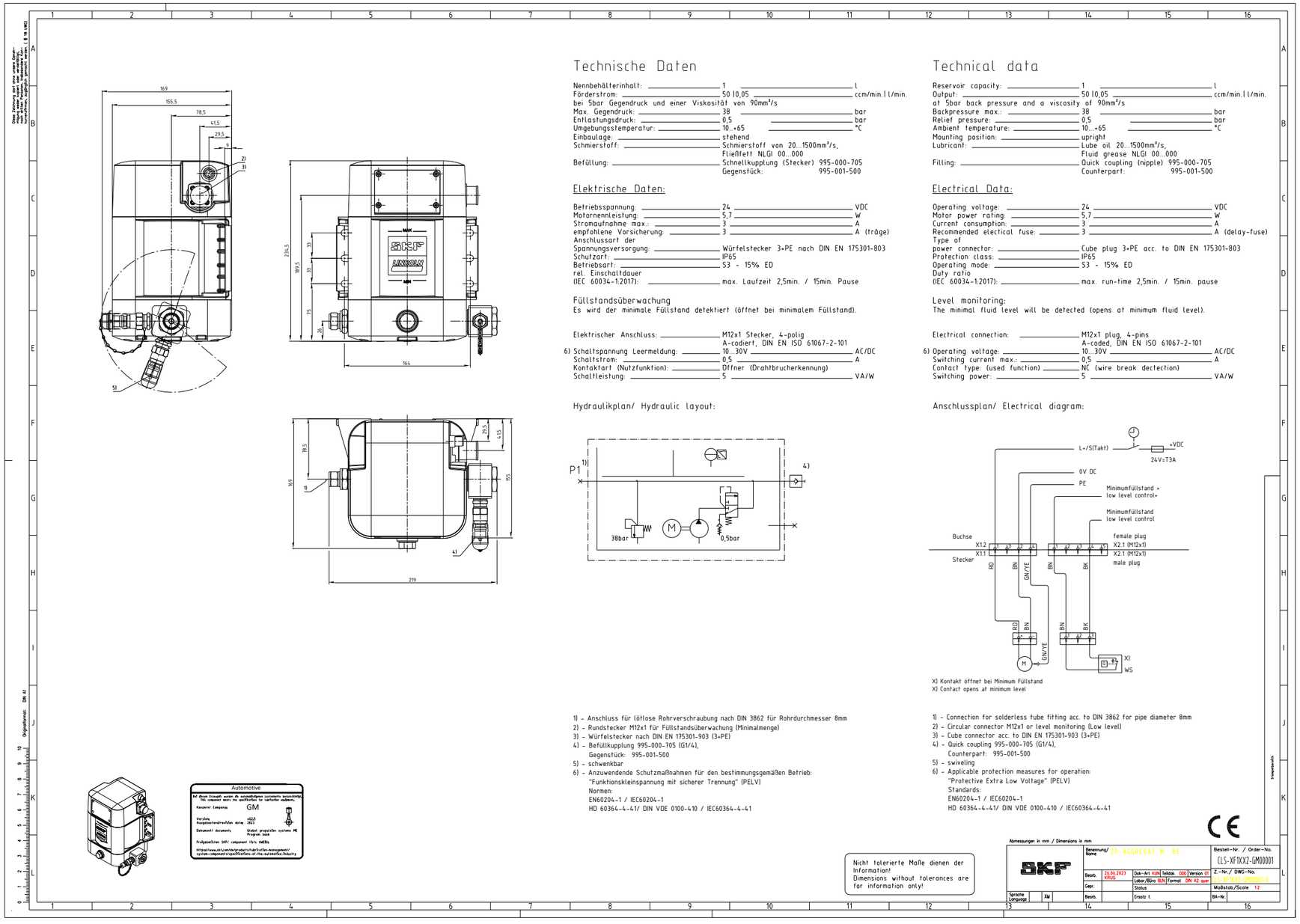
5.31. MFE2-KW3F-GM0N+1GD Gear Pump Unit for Fluid Grease



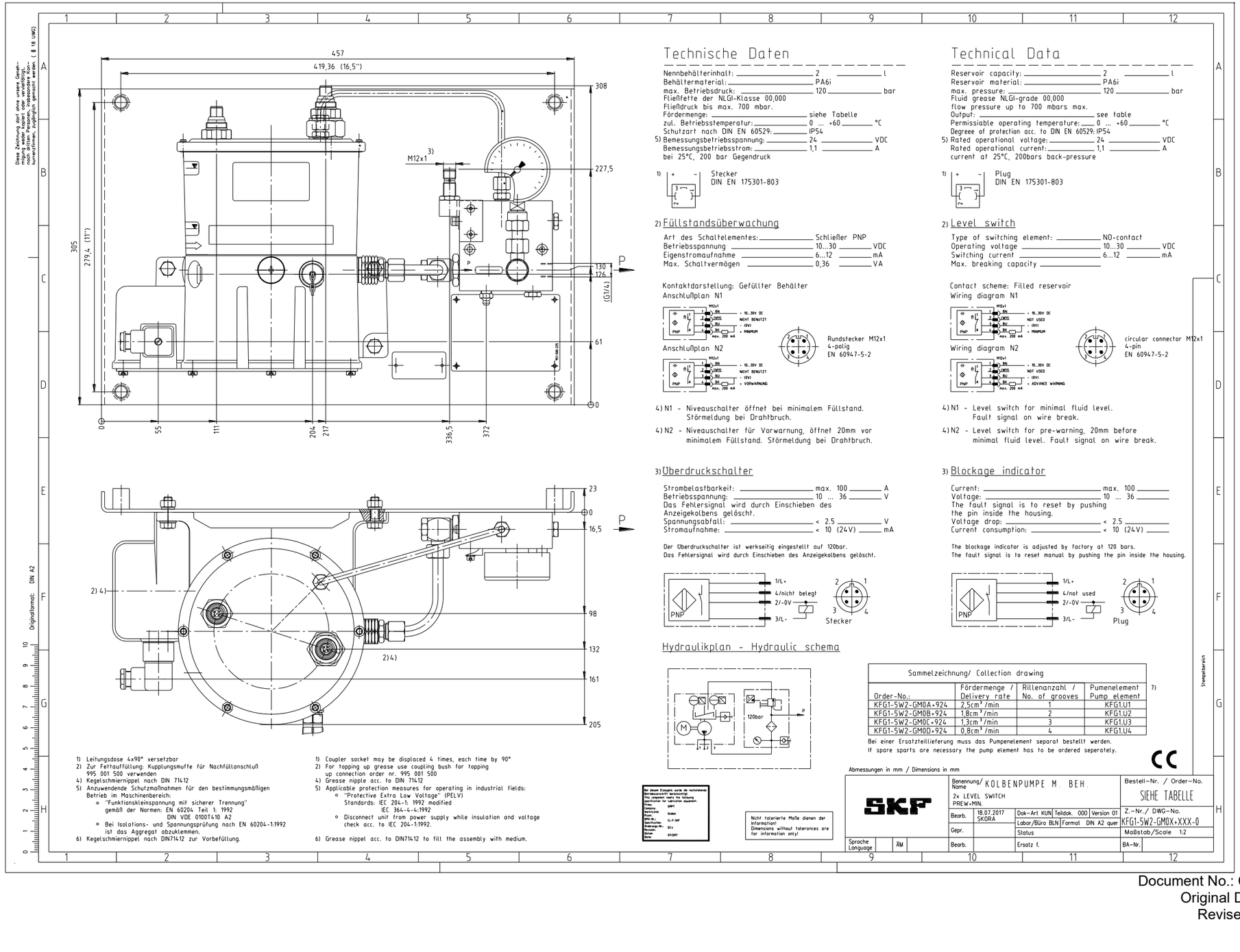
5.32. MFE2-KW6F-GM0N+1GD Gear Pump Unit for Fluid Grease



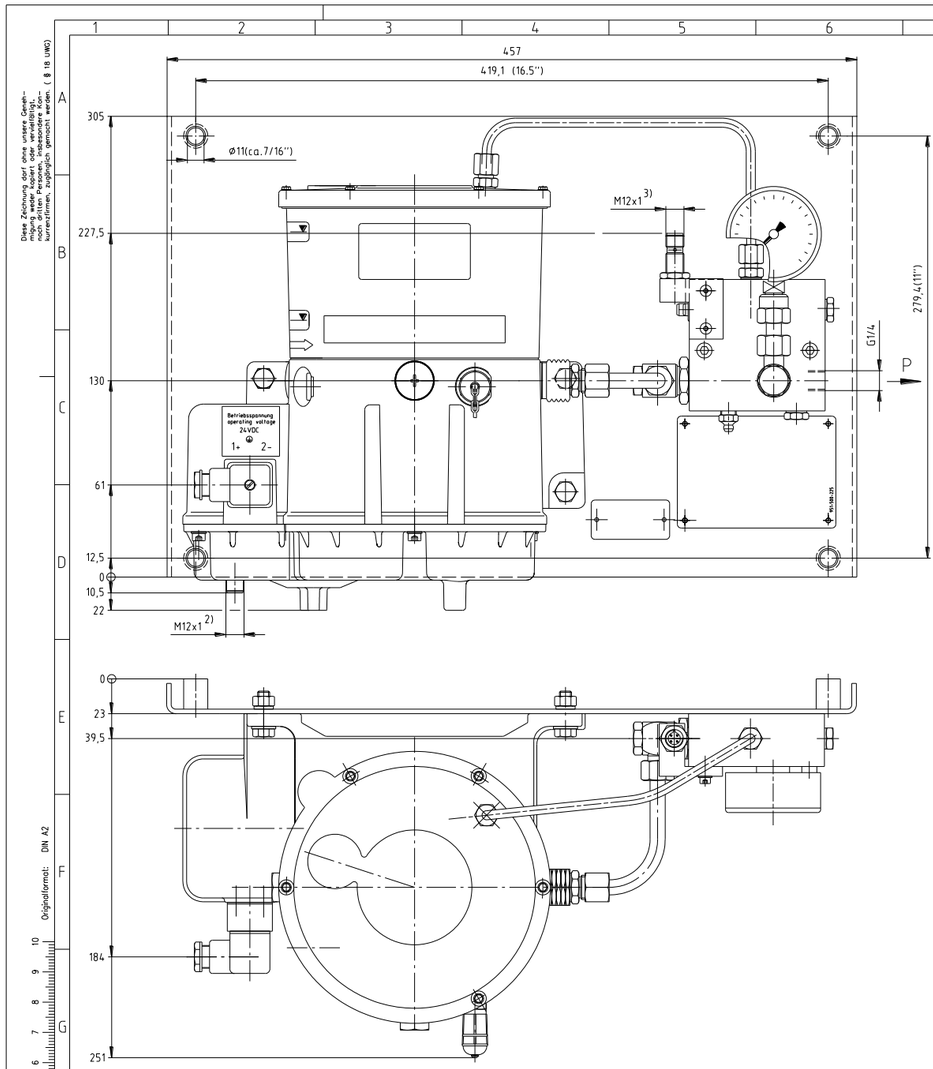
5.33. CLS-XF1XX2-GM00001 Lube Unit for Fluid Grease with 1 Liter Reservoir



5.34. KFG1-5W2-GM0*+924 Piston Pump, Electrically Operated, for NLGI 2 Grease Only



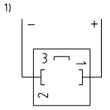
5.35. KFG1-5W1-GM0+924 Piston Pump, Electrically Operated, for NLGI 000, 00, 0 and 1 Grease



Technische Daten

Nennbehälterinhalt: 2 l
Behältermaterial: PA6i
max Betriebsdruck (X4): 120 bar
Fette der NLGI-Klasse 2
Fließdruck bis max. 700 bar.
zul. Betriebsstemperatur: 0 ... +60 °C
Schutzart nach DIN EN 60529: IP54
5) Bemessungsbetriebsspannung: 24 VDC
Bemessungsbetriebsstrom: 1,1 A
bei 25°C, 200 bar Gegendruck

1)

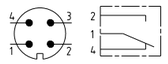


Stecker
DIN EN 175301-803

2) Füllstandsüberwachung

mechanisch, durch potentialfreien Reedkontakt
Kontaktform: Wechsler
Maximale Schaltleistung: 20 W / 20 VA
Maximale Schaltspannung: 100 V

Elektrische Anschlüsse
Pumpe: Stecker nach DIN EN 175301-803
Füllstandsüberwachung: Rundsteckverbinder M12x1

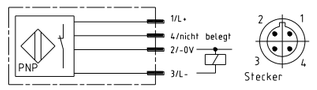


Kontaktdarstellung gefüllter Behälter

3) Überdruckschalter

Strombelastbarkeit: max. 100 A
Betriebsspannung: 10 ... 36 V
Das Fehlersignal wird durch Einschieben des Anzeigekolbens gelöscht.
Spannungsabfall: < 2,5 V
Stromaufnahme: < 10 (24V) mA

Der Überdruckschalter ist werkseitig eingestellt auf 120bar.
Das Fehlersignal wird durch Einschieben des Anzeigekolbens gelöscht.

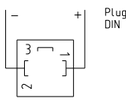


Stecker

Technical Data

Reservoir capacity: 2 l
Reservoir material: PA6i
max operating pressure (X4): 120 bar
Grease NLGI-grade 2
flow pressure up to 700 mbars max.
Permissiable operating temperature: 0 ... +60 °C
Degreee of protection acc. to DIN EN 60529: IP54
6) Rated operational voltage: 24 VDC
Rated operational current: 1,1 A
current at 25°C, 200bars back-pressure

1)

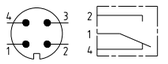


Plug
DIN EN 175301-803

2) Level switch

mechanical type, by off circuit reed switch.
Type: Change over contact
maximal switching power: 20 W / 20 VA
maximal switching voltage: 100 V

Electrical connections
Pump: Plug acc. to DIN EN 175301-803
Level monitoring: Circular connector M12x1

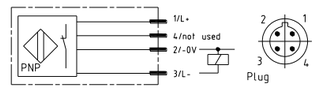


Contacts shown in filled reservoir

3) Blockage indicator

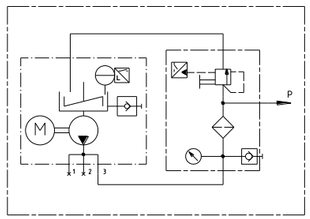
Current: max. 100 A
Voltage: 10 ... 36 V
The fault signal is to reset by pushing the pin inside the housing.
Voltage drop: < 2,5 V
Current consumption: < 10 (24V) mA

The blockage indicator is adjusted by factory at 120 bars.
The fault signal is to reset manual by pushing the pin inside the housing.



Plug

Hydraulikplan - Hydraulic schema



Sammelzeichnung/ Collection drawing		
Order-No.:	Fördermenge / Delivery rate	Rillenanzahl / No. of grooves 7)
KFG1-5W1-GM0A+924	2,5cm³/min	1
KFG1-5W1-GM0B+924	1,8cm³/min	2
KFG1-5W1-GM0C+924	1,3cm³/min	3
KFG1-5W1-GM0D+924	0,8cm³/min	4

1) Leitungsdose 4x90° versetzbar
2) Zur Fettauffüllung: Kupplungsmuffe für Nachfüllanschluß 995 001 500 verwenden
4) Kegelschmiernippel nach DIN 71412
5) Anzuwendende Schutzmaßnahmen für den bestimmungsmäßigen Betrieb im Maschinenbereich:
   - "Funktionskleinspannung mit sicherer Trennung" gemäß der Normen: EN 60204 Teil 1: 1992 DIN VDE 01007410 A2
   - Bei Isolations- und Spannungsprüfung nach EN 60204-1:1992 ist das Aggregat abzuklemmen.

1) Coupler socket may be displaced 4 times, each time by 90°
2) For topping up grease use coupling bush for topping up connection order nr. 995 001 500
4) Grease nipple acc. to DIN 71412
5) Applicable protection measures for operating in industrial fields:
   - "Protective Extra Low Voltage" (PELV) Standards: IEC 204-1: 1992 modified IEC 364-4-4:1992
   - Disconnect unit from power supply while insulation and voltage check acc. to IEC 204-1:1992.

Bei diesem Erzeugnis wurde die nachstehende Betriebsvorschrift berücksichtigt.
This component meets the following specification for lubrication equipment.
Firma: GMFI
Company:
Werk/Land: Gradel
Plant:
BMV-Nr.: CL-K-SKF
Specification:
Änderungs-Nr.: 02.x
Revision:
Datum: 07/2017
Date:

Nicht tolerierte Maße dienen der Information!
Dimensions without tolerances are for information only!

Abmessungen in mm / Dimensions in mm

SKF	Benennung/ Name: KOLBENPUMPE M. BEH.				Bestell-Nr. / Order-No.: SIEHE TABELLE
	Bearb. 18.07.2017 SKORA	Dok-Art KUN	Teildok. 000	Version 01	Z.-Nr. / DWG-No.
	Gepr.	Labor/Büro BLN	Format DIN A2 quer		KFG1-5W1-GM0X+XXX-0
		Status			Maßstab/Scale 1:2
Sprache Language: XM	Bearb.	Ersatz f.			BA-Nr.

Originalformat: DIN A2

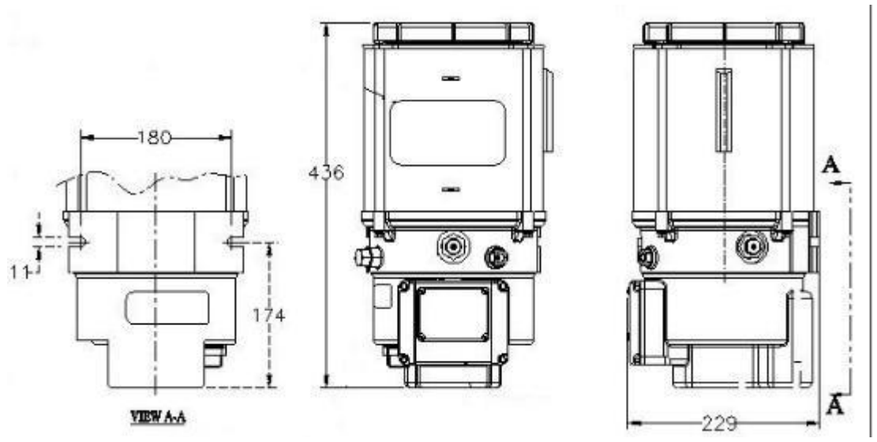
Steuerbereich

5.36. 278517 / 278518 Electrically Operated Piston Pumps for Grease, 4 Liters / 8 Liters

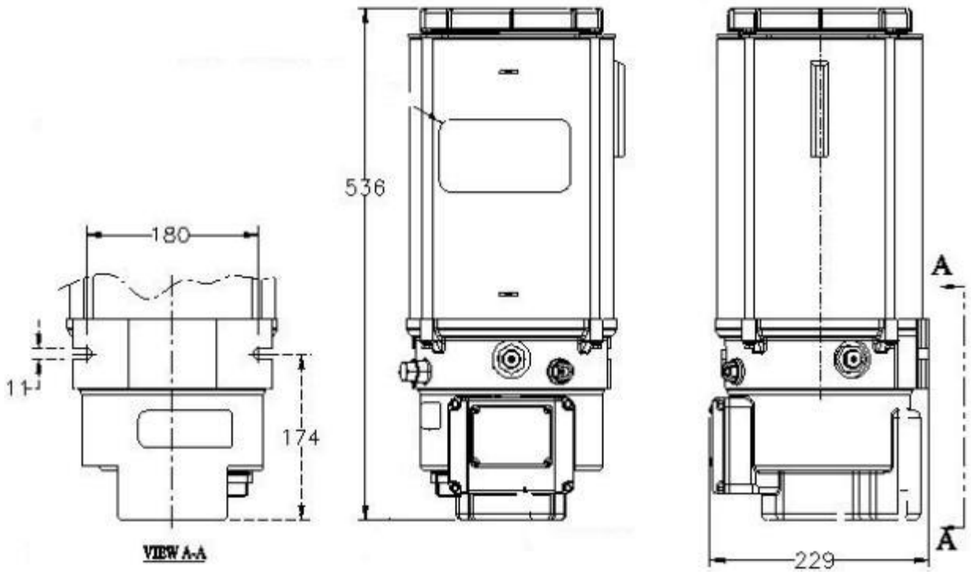
Lincoln P653 Pump Features – Models 80141 & 80142

- Integrated pup supplies lubricant to a single line parallel lubrication system
- Pumps low and high viscosity greases up to NLGI 2 grade grease
- Operating temperature range from -40°F to 158°F
- Can be used with any Lincoln Centro-Matic injector
- Includes internal pressure switch that shuts off the pump when supply pressure in the pump reaches 3500 psi
- Only requires 3-5 second 24 VDC signal, supplied by the machine, to initiate the lube cycle. Once the lube cycle is initiated, the pump controls the cycle
- G1/4 supply line connections
- 24 VDC, 10A maximum current
- IP69K enclosure rating
- Grease output 1.5 in³/min

Model 80141 – 4 Liter Reservoir

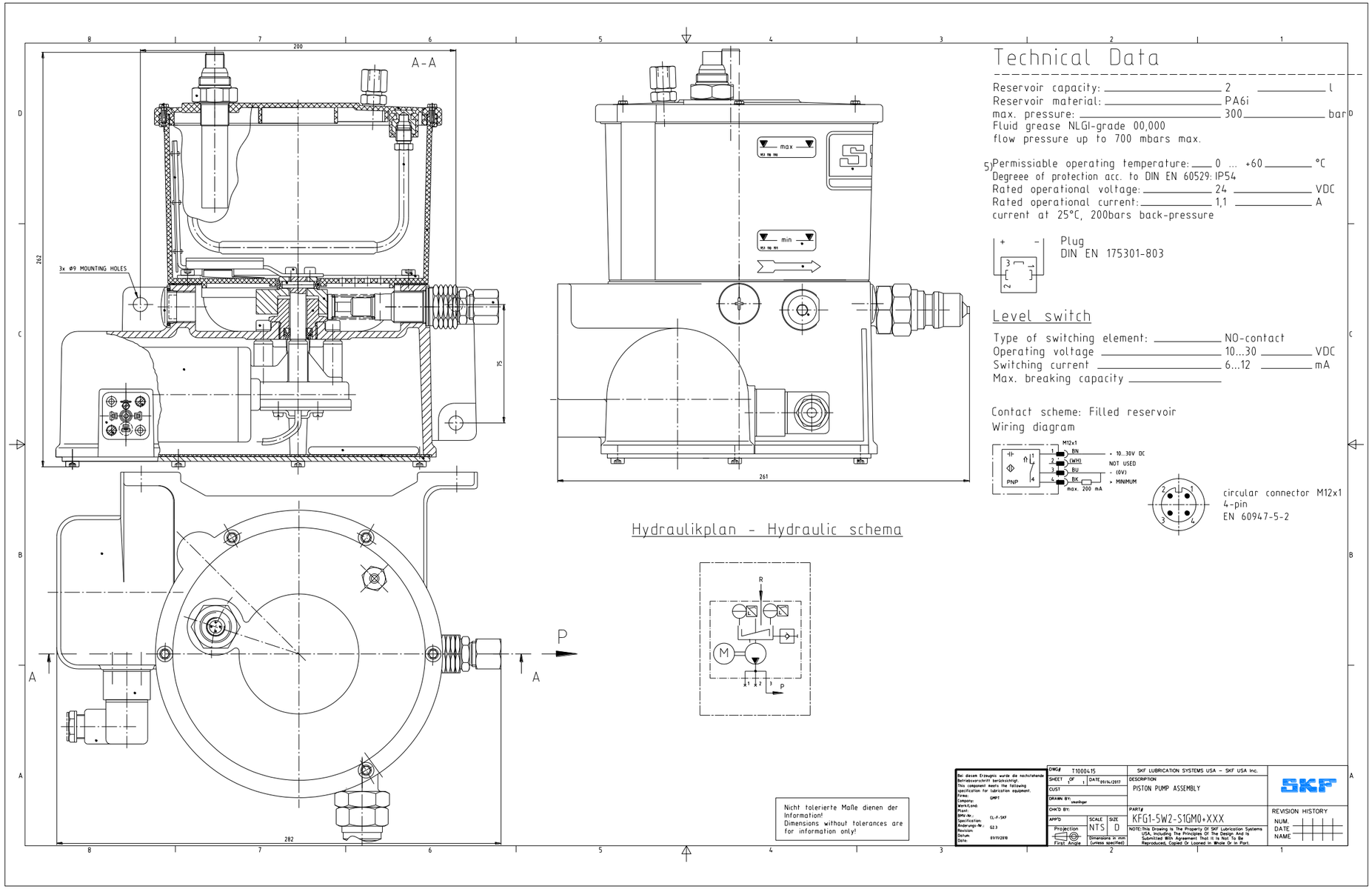


Model 80142 – 8 Liter Reservoir

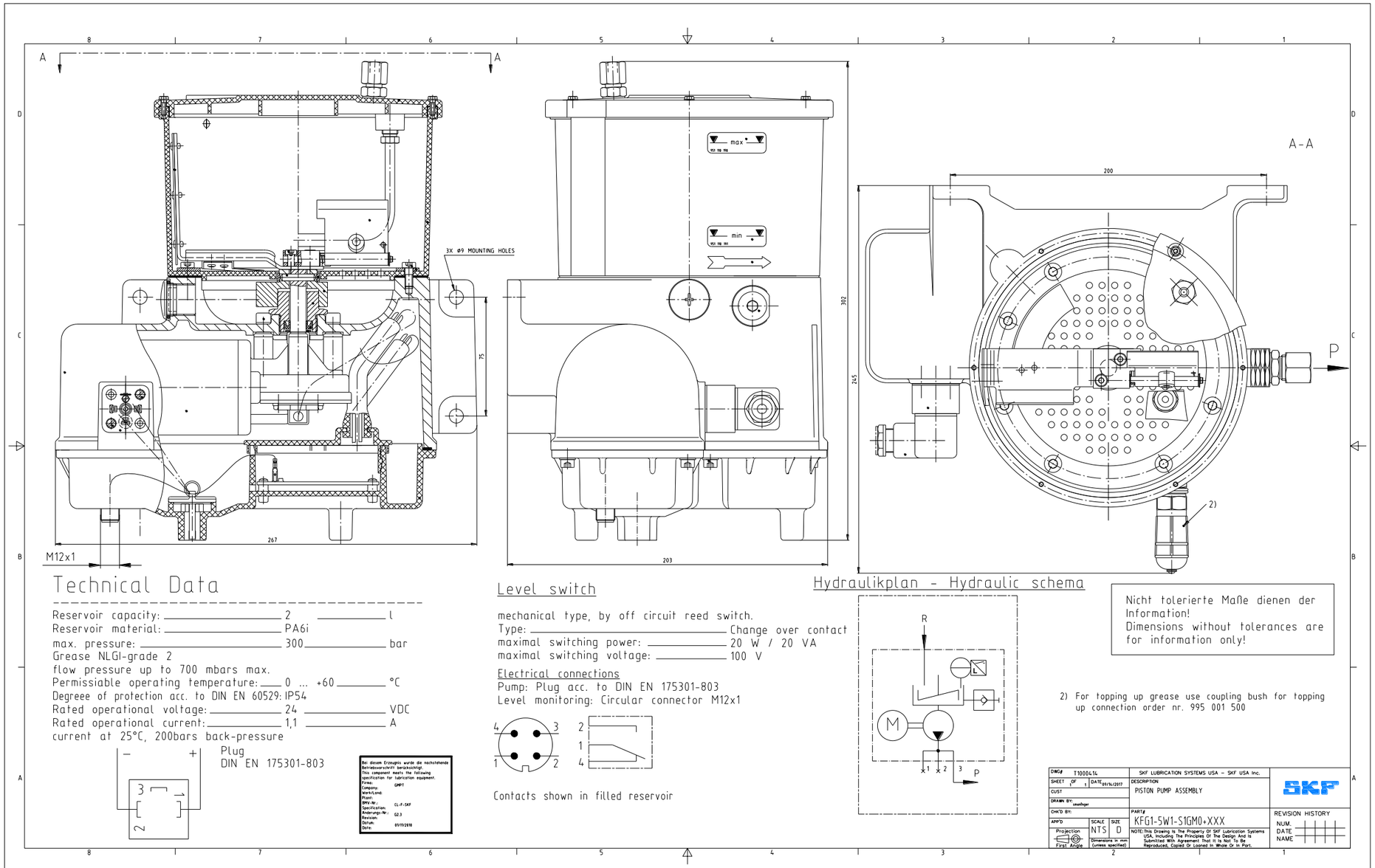


Note – An internal transducer variation with adjustable maximum pump pressure range from 1400 – 4600 psi (96 – 317 bar) can be included upon request for both reservoir sizes.

5.37. KFG1-5W2-S1GM0+924



5.38. KFG1-5W1-S1GM0+924



Technical Data

Reservoir capacity:	2	l
Reservoir material:	PA6i	
max. pressure:	300	bar
Grease NLGI-grade 2		
flow pressure up to 700 mbars max.		
Permissiable operating temperature:	0 ... +60	°C
Degreee of protection acc. to DIN EN 60529:	IP54	
Rated operational voltage:	24	VDC
Rated operational current:	1,1	A
current at 25°C, 200bars back-pressure		

Plug
DIN EN 175301-803

Bei diesem Erzeugnis wurde die nachstehende Betriebsvorschrift berücksichtigt.
This component meets the following specification for lubrication equipment.
Firma: GMDT
Company:
Werkstand:
Print:
BMV-Nr.: CL-F-SKF
Specification:
Änderungs-Nr.: G2.3
Revision:
Datum: 01/11/2018
Date:

Level switch

mechanical type, by off circuit reed switch.
Type: Change over contact
maximal switching power: 20 W / 20 VA
maximal switching voltage: 100 V

Electrical connections
Pump: Plug acc. to DIN EN 175301-803
Level monitoring: Circular connector M12x1

Contacts shown in filled reservoir

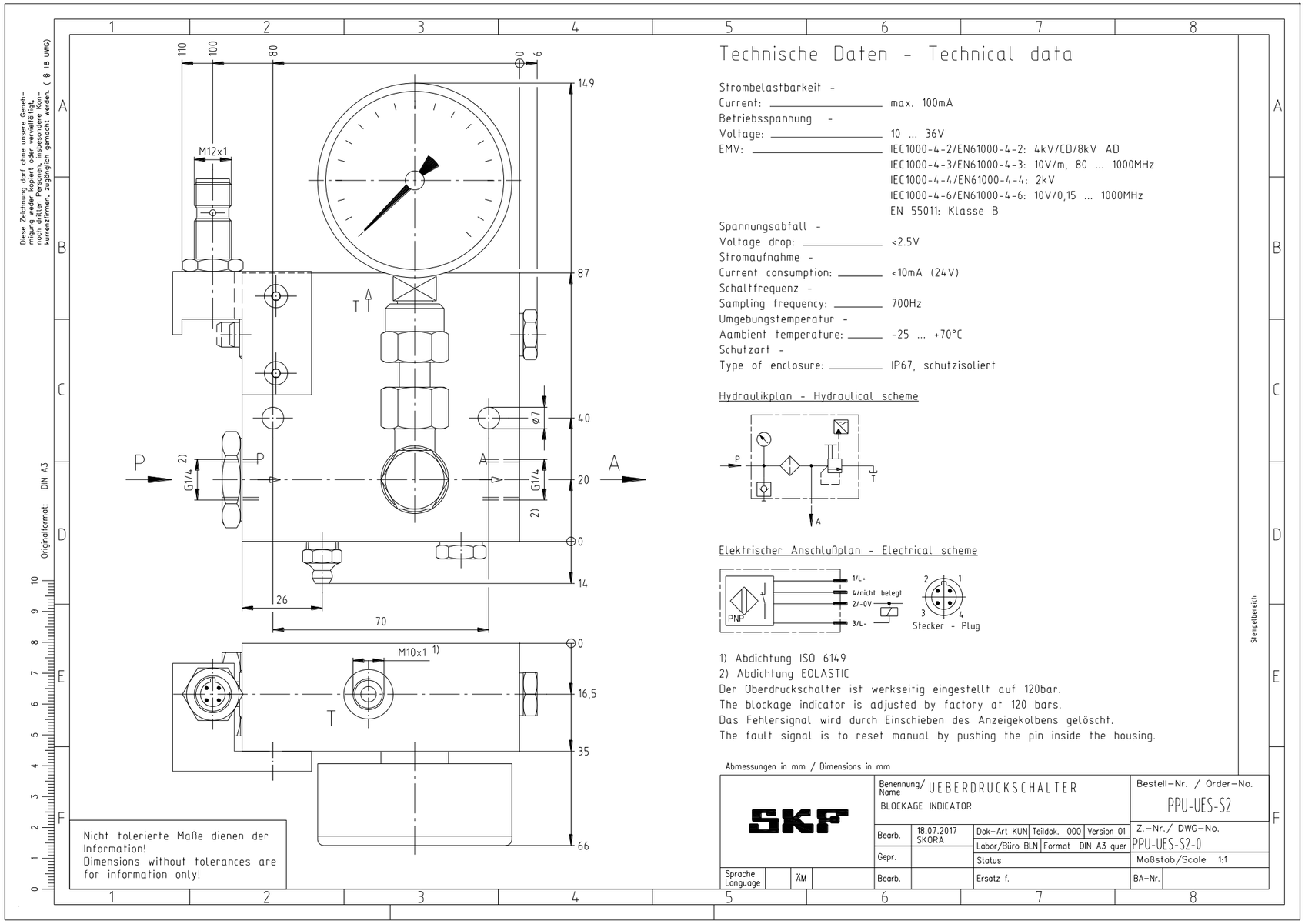
Hydraulikplan - Hydraulic schema

Nicht tolerierte Maße dienen der Information!
Dimensions without tolerances are for information only!

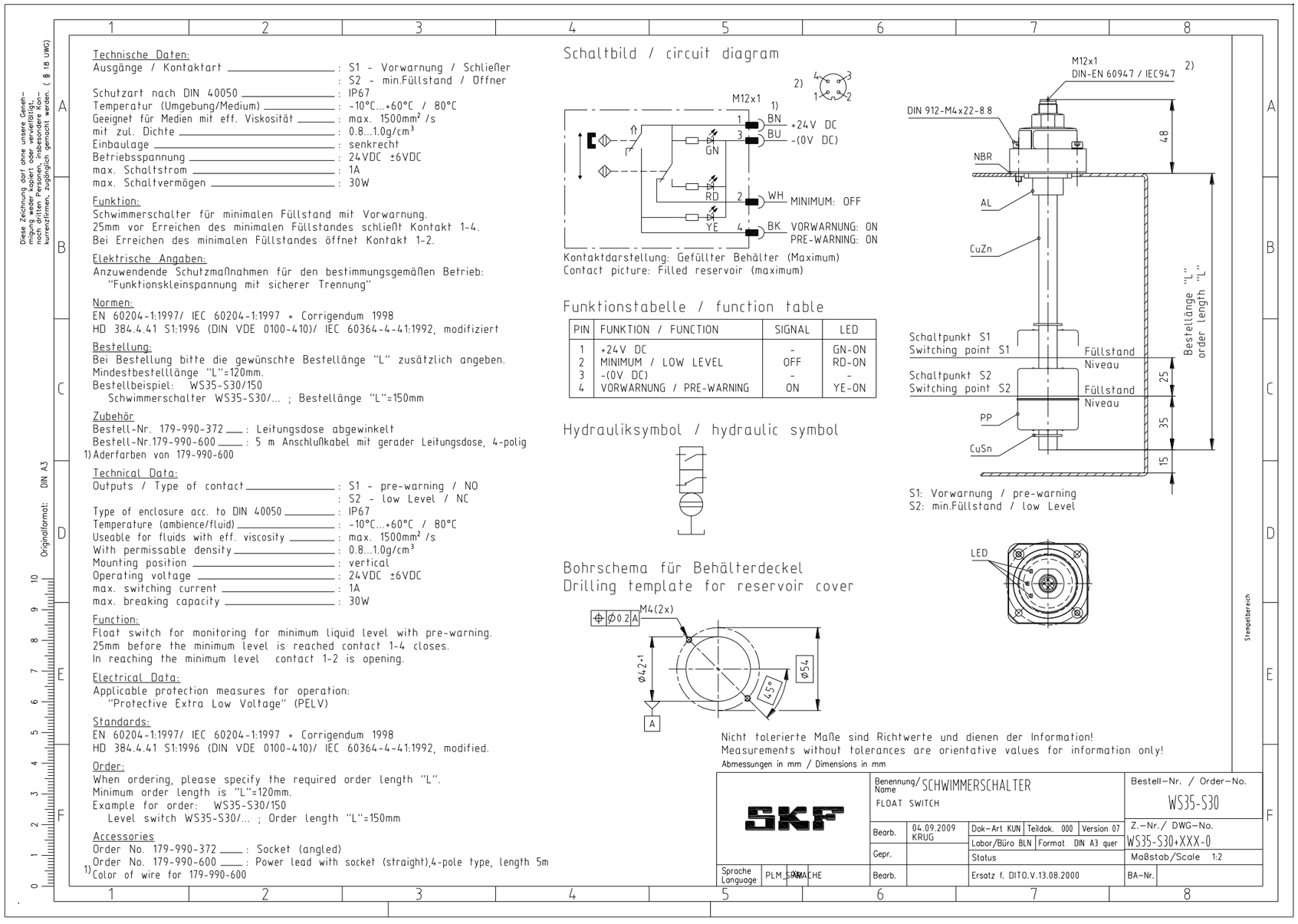
2) For topping up grease use coupling bush for topping up connection order nr. 995 001 500

DWG# T1000414	SKF LUBRICATION SYSTEMS USA – SKF USA Inc.	
SHEET OF 1 1 / DATE 01/11/2017	DESCRIPTION: PISTON PUMP ASSEMBLY	SKF
CUST		
DRAWN BY: steinberger		
CHK'D BY:	PART# KFG1-5W1-S1GM0+XXX	REVISION HISTORY
APP'D	SCALE NTS / SIZE D	NUM.
Projection: First Angle	Dimensions in mm (unless specified)	DATE
	NOTE: This Drawing Is The Property Of SKF Lubrication Systems USA, Including The Principles Of The Design And Is Submitted With Agreement That It Is Not To Be Reproduced, Copied Or Loaned In Whole Or In Part.	NAME

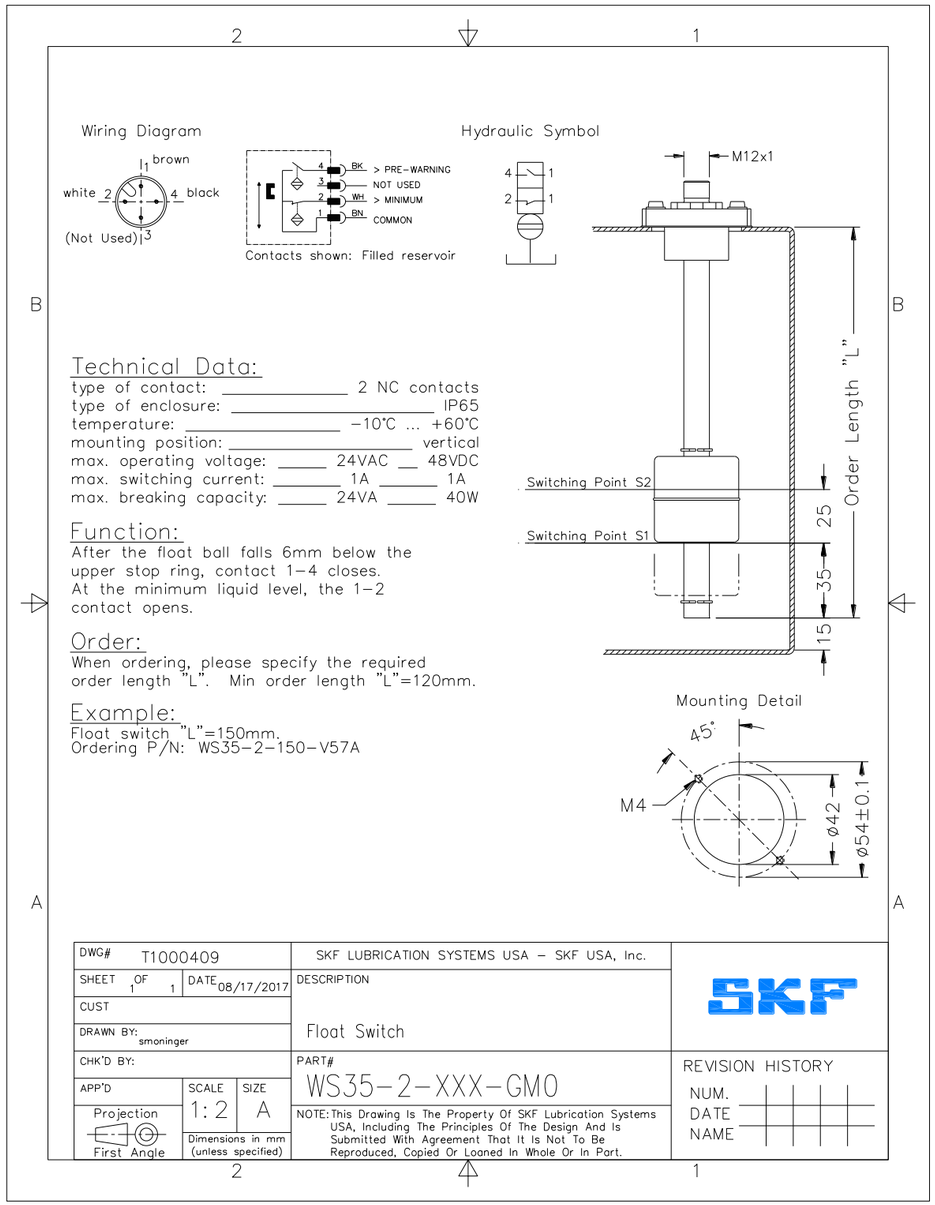
5.39. PPU-UES-S2



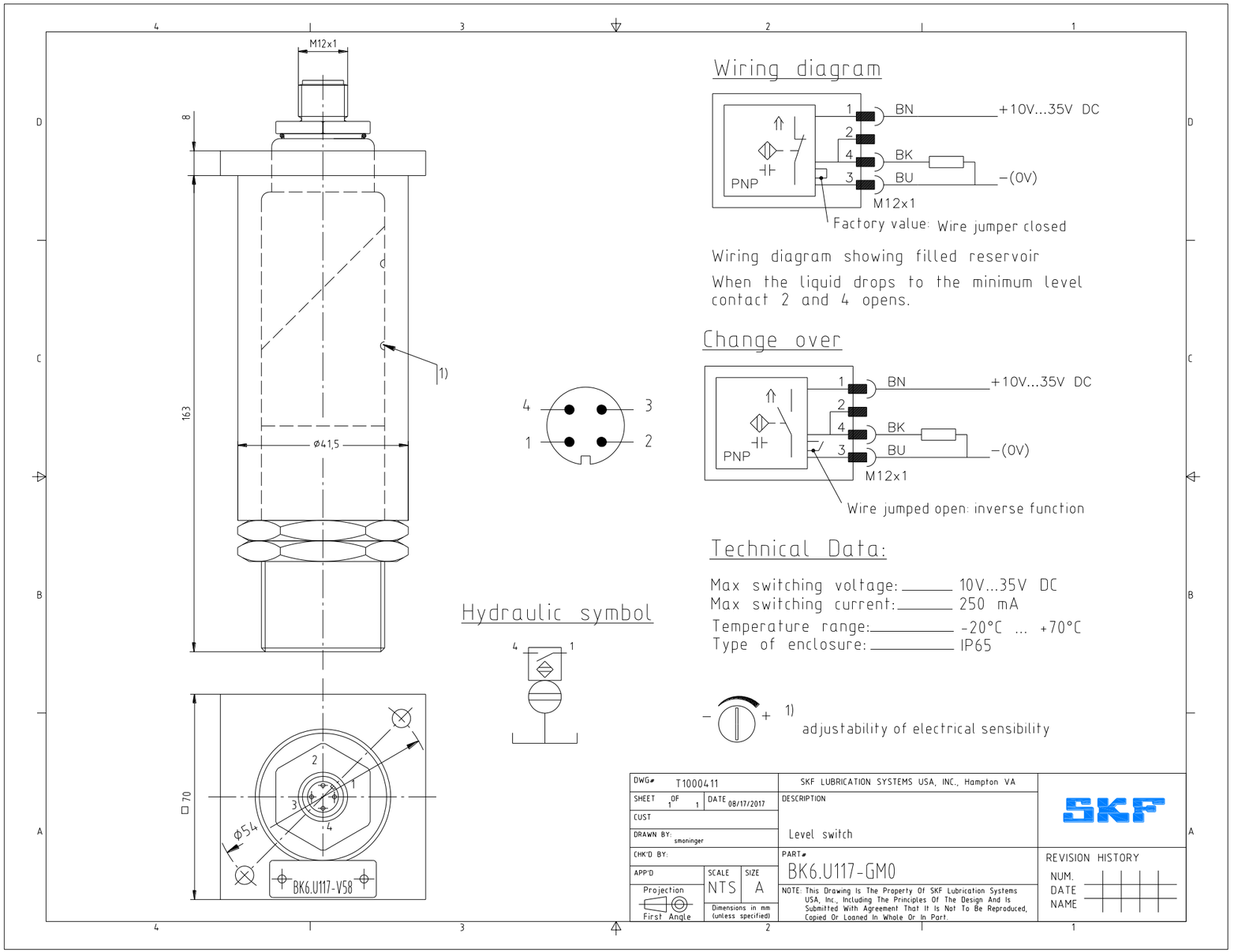
5.40. WS35-S30+***Float Switch for Minimum Level with Pre-Warning



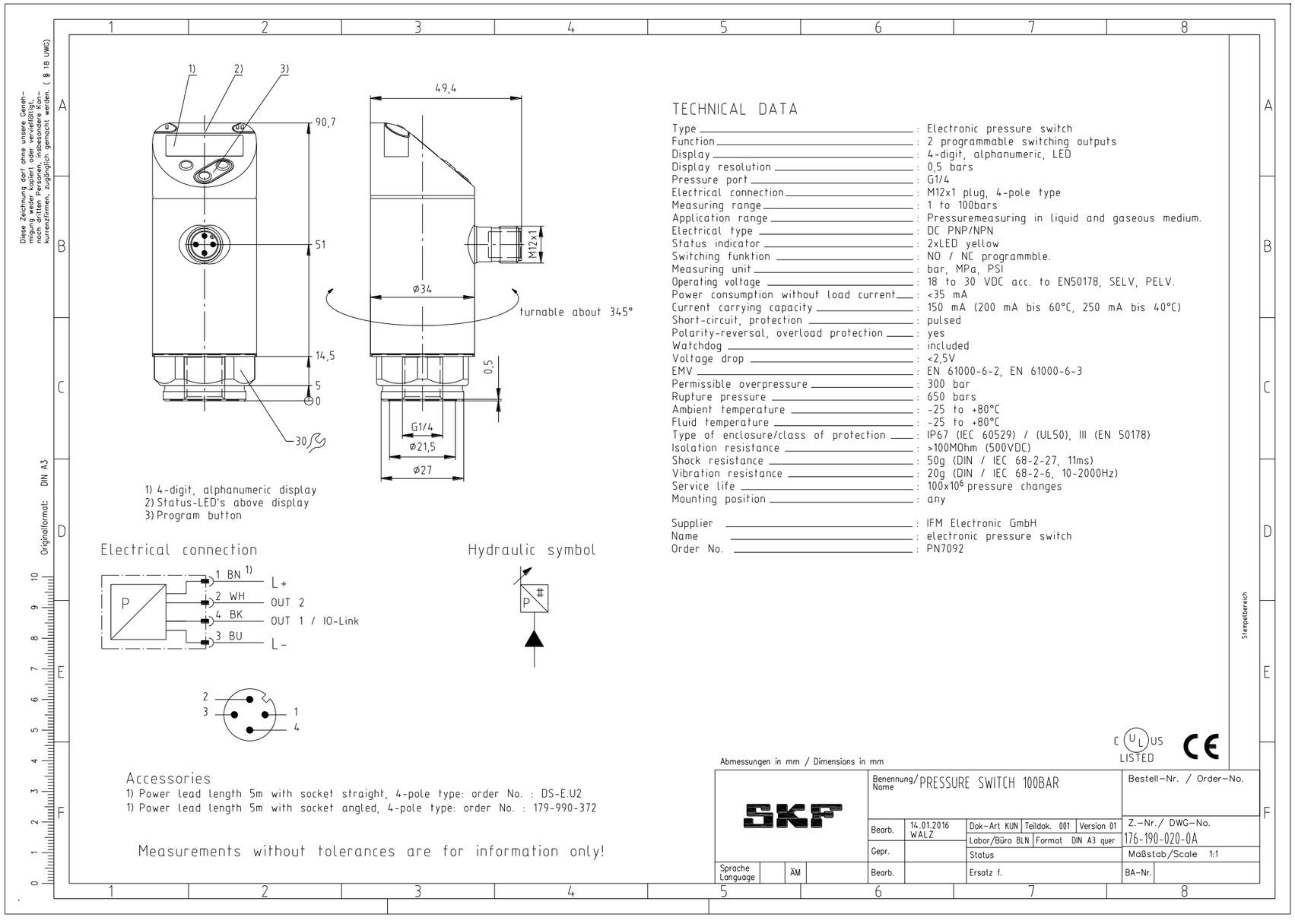
5.41. WS35-2-***-GM0 Float Switch for Minimum Level with Pre-Warning



5.42. BK6.U117-GM0 Level Switch for Fluid Grease



5.43. 176-190-020 Digital Pressure Switch

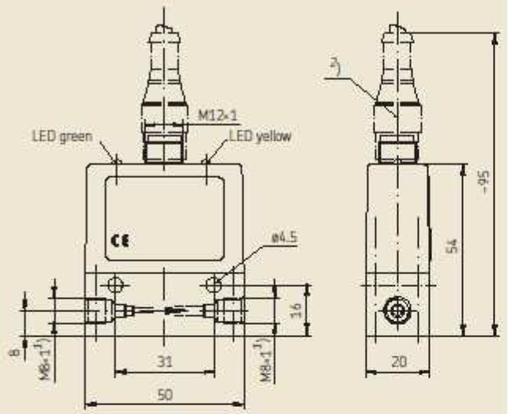


5.44. Flow Sensors GS300 / GS304

Flow sensor	GS300 GS304N GS304P	10 – 600 mm³/Impuls	Intermittend centralized lubrication systems, e.g. with piston distributors, metering elements, injection oilers	4	8

Flow sensors for monitoring of lubricant feedright at the lube point

Fig. 4



1) *Port tapped for solderless 4 mm diam. tube connection*

2) *Accessories*
GS300: 5 m connection cable, order No. GS200.U4
GS304P / GS304N: 5 m connection cable with straight line socket, 4-pole type, order No. 179-990-600

Technical data

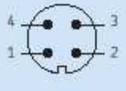
Measuring principle	calorimetrical
Suitable metered quantities	from 0.01 to 0.6 cm³/pulse
Clock frequency[3]	max. 4 pulse/min
Lubricant[4]	oil and grease, NLGI grades 000, 00
Max. operating pressure	40 bars
Operating temperature	+10 °C to +50 °C
Installation	directly upstream of lube point
Vibration resistance	20 g (DIN/IEC 68-2-27, 10-2000 Hz)
Impact resistance	50 g (DIN/IEC 68-2-27, 11 ms)

3) *Sensor needs 30 sec. of warmup time.*

4) *The use of lubricants containing corrosive and/or abrasive additives may impair sensor function and possibly damage the sensor.*

Electrical data

Rated voltage U_N	24 V DC
Residual ripple	10%
Working range U_A	18 to 30 V DC
Max. power consumption I_E	25 mA
Pulse output	3 s
Load current I_A for GS300	max. 10 mA
for GS304	max. 500 mA per output
Output protection	short-circuit protection
Built-in plug	circular connector with M12×1 screw plug

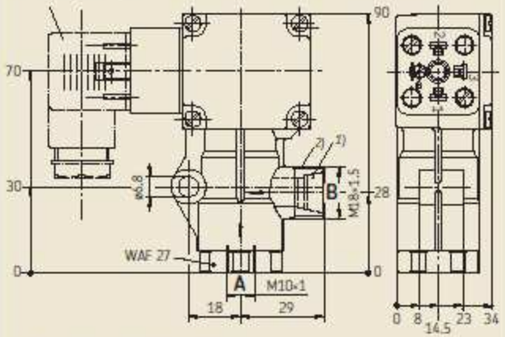
Order No.	Switching function		Electrical connection
GS300	Pin 1 (BN - brown):	+ 24 V	
	Pin 3 (BU - blue):	0 V	
	Pin 4 (BK - black):	PNP/NO – closes in event of flow	
GS304P	Pin 1 (BN - brown):	+ 24 V	
	Pin 2 (WH- white):	PNP/NC – opens in event of flow	
	Pin 3 (BU - blue):	0 V	
	Pin 4 (BK - black):	PNP/NO – closes in event of flow	
GS304N	Pin 1 (BN - brown):	+ 24 V	
	Pin 2 (WH- white):	NPN/NC – opens in event of flow	
	Pin 3 (BU - blue):	0 V	
	Pin 4 (BK - black):	NPN/NO – closes in event of flow	

5.45. Flow Monitors 171-100-011 / 171-210-***

Flow monitors for monitoring of an intermittend flow of oil

Totalloss lubrication systems

Fig. 1



Note: See application I, page 4.

[1]) *Port tapped for cutting-sleeve screw union EO-2 DIN 2353 / ISO 8434-1*
[2]) *DIN 2353 / ISO 8434-1. Only permissible for the use of preassembled fittings. We recommend use of a preassembled EO-2 screw union. (Example: GA21...23/GA30)*

Technical data

Number of cycles	max. 2/min [3])
Operating viscosity	20-750 mm²/s
Actuating pressure	min. 4 bars [4]) max. 30 bars
Electr. switching	changeover 250 V AC, 0,5 A
Type of enclosure	IP 44
Mounting position	any
Materials:	
Housing	die-cast zinc, polyamide
Seals	NBR (FKM version on request)

[3]) *Suitable for medial operating viscosity. In case of higher viscosity decreases the number of cycles.*

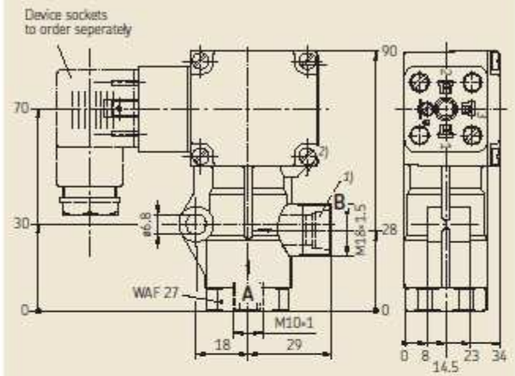
[4]) *In single line centralized lubrication systems the main line needs to have before the distributors a pressure of at least 14 bars.*

Order No.	Flow rate
171-100-011	0,2 – 1,5 cm³/pass

Flow monitors for the monitoring of a continuous flow of oil

circulating lubrication systems with 50 bis 1800 cm³/min or 1,6 bis 14 l/min

Fig. 2



Note: See application II + III on page 4 + 5.

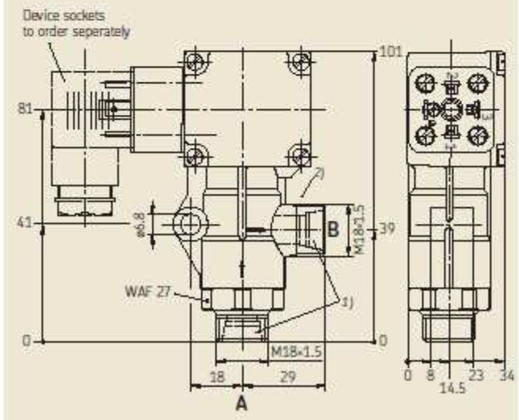
Technical data

Operating viscosity	20 – 1000 mm²/s
Actuating pressure	min. 4 bars [3]), max. 25 bars
Electr. switching	changeover 250 V AC, 0,5 A
Perm. operating temperature	+ 5 bis +80 °C
Type of enclosure	IP 65
Mounting position	any
Materials:	
Housing	die-cast zinc, polyamide
Seals	NBR (FKM version on request)

[3]) *If the flow monitors are equipped with metering restrictors, at least 6 bars are required in the feed lin*

Order No. (Fig. 2)	Flow rate
171-210-051	50 – 100
171-210-052	100 – 200
171-210-053	200 – 500 cm³/min
171-210-054	500 – 800
171-210-055	800 – 1800

Fig. 3



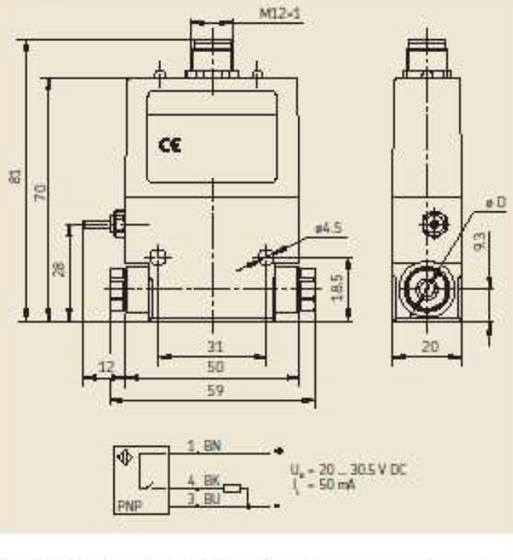
Order No. (Fig. 3)	Flow rate
171-210-061	1,6 – 2,5
171-210-062	2,3 – 4,0
171-210-063	3,6 – 6,0 l/min
171-210-064	5,5 – 10,0
171-210-065	8,0 – 14,0

[1]) *Port tapped for cutting-sleeve screw union EO-2 DIN 2353 / ISO 8434-1*
[2]) *DIN 2353 / ISO 8434-1. Only permissible for the use of preassembled fittings. We recommend use of a preassembled EO-2 screw union. (Example: GA21...23/GA30)*

5.46. Oil Streak Sensor GS4011-S*** / GS6011-S***

The oil-streak sensors monitor the continuity of the oil flow in oil+air lubrication systems

Fig. 5



So-called oil+air centralized lubrication systems are used to supply high-speed rolling bearings in tool spindles. The bearings are supposed to be supplied with extremely small quantities of lubricant (minimal-quantity lubrication) in the case of these applications.
To achieve such small quantities of oil per unit of time, what was originally a relatively large drop of oil is torn apart by a current of air on its way from the metering point to the bearing. The oil to be delivered is fed in the line to the bearing as a thin flow of lubricant along the wall.

Monitoring:
So far, only the metered quantity of oil from the metering element has been checked upstream of the oil and air mixing point. The oil-streak sensor makes it possible to monitor the transport of a fine current of oil along the secondary line's wall downstream of the oil and air mixing point. The closer the sensor is located to the lube point, the more reliable the system monitoring.

Technical data

Measuring principle	optical
Fluid	oil + air
Max. operating pressure	10 bars
Operating temperature	0 to +60 °C
Mounting position	any

Electrical data

Rated voltage U_N	24 V DC [1])
Operating range U_B	20 to 30.5 V DC
Max. power consumption I_E	40 mA
Type of enclosure	IP54
Outputs	pnp type
closes when oil streaks detected, opens when there are none	

Color coding with standard sensor cables:

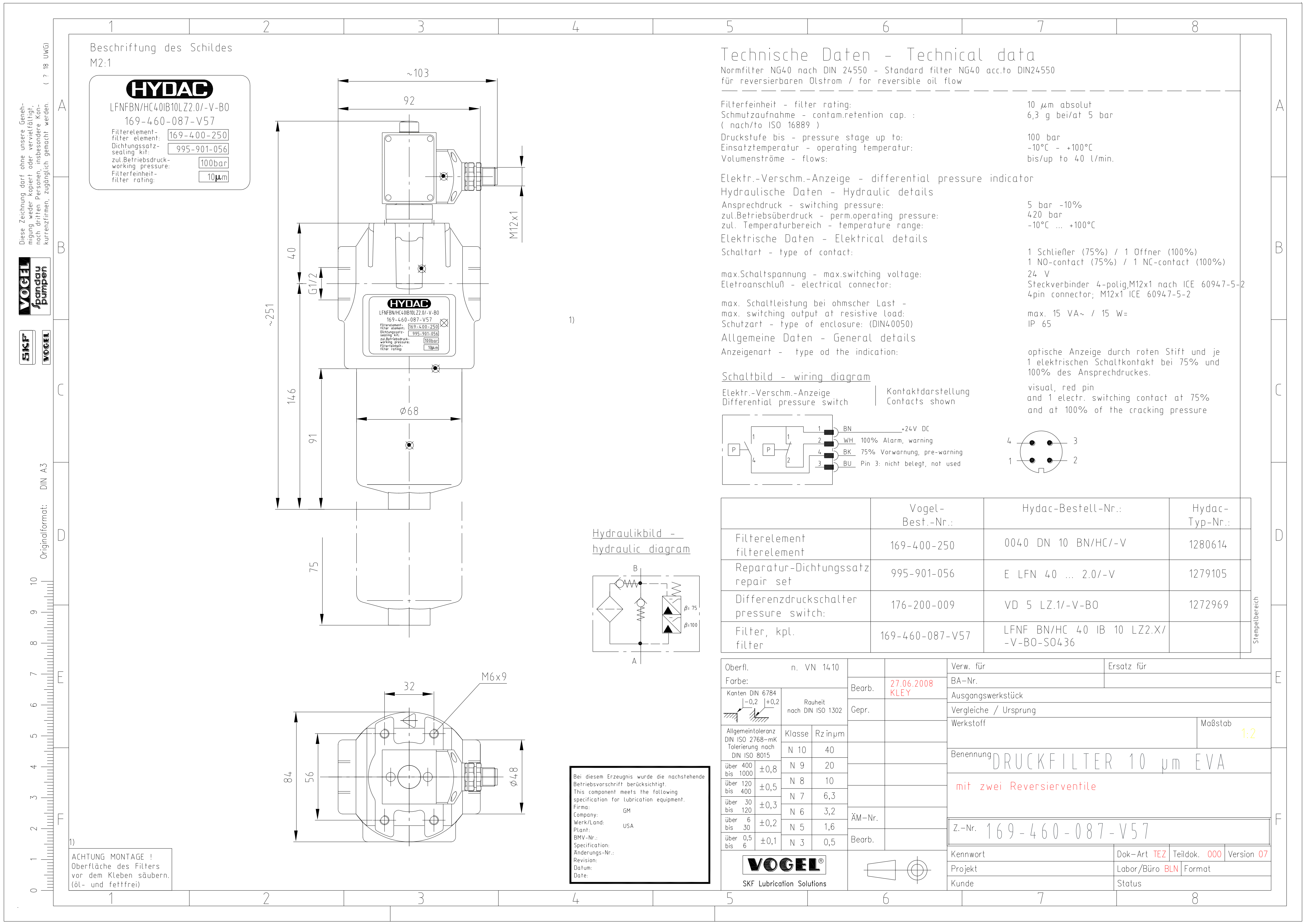
brown (BN)	+24 V
blue (BU)	GND
black (BK)	make contact
white (WH)	break contact

[1]) *Protective measure to be taken for operation in conformity with "Functional Extra-Low Voltage with Safety Separation" (PELV = Protective Extra-Low Voltage)*

Accessories:
Connection cable with straight cable socket, 4-pole type, length 5 m, order No. 179-990-600
Socket, 90° angled, order No. 179-990-372

Order No.	Plastic tubing ø D	Flow rate
GS4011-S20	4	120 – 600 mm³/h
GS4011-S50	4	60 – 120 mm³/h
GS6011-S20	6	120 – 600 mm³/h
GS6011-S50	6	60 – 120 mm³/h
GS4011-S300	4	from 2 mm³/pulse
GS6011-S300	6	from 2 mm³/pulse

5.47. Pressure Filter 169-460-087-V57


Beschriftung des Schildes
M2:1
HYDAC
LFNFBN/HC40IB10LZ2.0/-V-BO
169-460-087-V57
Filterelement- filter element: 169-400-250
Dichtungssatz- sealing kit: 995-901-056
zul.Betriebsdruck- working pressure: 100bar
Filterfeinheit- filter rating: 10µm
Technische Daten - Technical data
Normfilter NG40 nach DIN 24550 - Standard filter NG40 acc.to DIN24550
für reversierbaren Ölstrom / for reversible oil flow
Filterfeinheit - filter rating: 10 µm absolut
Schmutzaufnahme - contam.retention cap. : (nach/to ISO 16889) 6,3 g bei/at 5 bar
Druckstufe bis - pressure stage up to: 100 bar
Einsatztemperatur - operating temperatur: -10°C - +100°C
Volumenströme - flows: bis/up to 40 l/min.
Elektr.-Verschm.-Anzeige - differential pressure indicator
Hydraulische Daten - Hydraulic details
Ansprechdruck - switching pressure: 5 bar -10%
zul.Betriebsüberdruck - perm.operating pressure: 420 bar
zul. Temperaturbereich - temperature range: -10°C ... +100°C
Elektrische Daten - Elektrical details
Schaltart - type of contact: 1 Schließer (75%) / 1 Öffner (100%) 1 NO-contact (75%) / 1 NC-contact (100%)
max.Schaltspannung - max.switching voltage: 24 V
Eletroanschluß - electrical connector: Steckverbinder 4-polig,M12x1 nach ICE 60947-5-2 4pin connector; M12x1 ICE 60947-5-2
max. Schaltleistung bei ohmscher Last - max. switching output at resistive load: max. 15 VA~ / 15 W=
Schutzart - type of enclosure: (DIN40050) IP 65
Allgemeine Daten - General details
Anzeigenart - type od the indication: optische Anzeige durch roten Stift und je 1 elektrischen Schaltkontakt bei 75% und 100% des Ansprechdruckes. visual, red pin and 1 electr. switching contact at 75% and at 100% of the cracking pressure
Schaltbild - wiring diagram
Elektr.-Verschm.-Anzeige Differential pressure switch
Kontaktdarstellung Contacts shown
BN +24V DC
WH 100% Alarm, warning
BK 75% Vorwarnung, pre-warning
BU Pin 3: nicht belegt, not used
Hydraulikbild - hydraulic diagram
ACHTUNG MONTAGE ! Oberfläche des Filters vor dem Kleben säubern. (öl- und fettfrei)
Bei diesem Erzeugnis wurde die nachstehende Betriebsvorschrift berücksichtigt. This component meets the following specification for lubrication equipment.
Firma: Company: GM
Werk/Land: Plant: USA
Bearb. 27.06.2008 KLEY
Benennung DRUCKFILTER 10 µm EVA
mit zwei Reversierventile
Z.-Nr. 169-460-087-V57
VOGEL SKF Lubrication Solutions

	Vogel-Best.-Nr.:	Hydac-Bestell-Nr.:	Hydac-Typ-Nr.:
Filterelement filterelement	169-400-250	0040 DN 10 BN/HC/-V	1280614
Reparatur-Dichtungssatz repair set	995-901-056	E LFN 40 ... 2.0/-V	1279105
Differenzdruckschalter pressure switch:	176-200-009	VD 5 LZ.1/-V-BO	1272969
Filter, kpl. filter	169-460-087-V57	LFNF BN/HC 40 IB 10 LZ2.X/-V-BO-SO436	

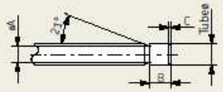
5.48. Push to Connect Fittings

For pressures up to 300 bar, 3-O-ring

Claw grooves

for tube ø	A +0.3	B +0.2	C
4	3.1	5	0.3 ... 0.7
6	4.9	6.2	0.4 ... 0.9
8	6.9	6.2	0.5 ... 0.9

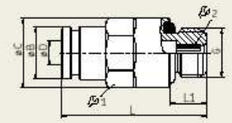
Claw grooves



Adaptors with cylindrical thread (→ Figure 13)

Order No.	Tube øD	G	L1	ø B	ø C	L	⌀1	⌀2	Seal
451-004-260-VS	4	M6	4.5	8.8	11.5	25	10	2.5	NBR
404-073-VS	4	M6×0.75	4.5	8.8	11.5	25.3	10	2.5	NBR
404-063-VS	4	M8	6	8.8	11.5	23.8	10	2.5	NBR
404-003-VS	4	M8×1	6	8.8	11.5	23.8	10	2.5	NBR
404-003-S8-VS	4	M8×1	6	8.8	11.5	23.8	10	2.5	FPM
404-006-VS	4	M10×1	6	8.8	13.5	23.8	12	2.5	NBR
404-006-S8-VS	4	M10×1	6	8.8	13.5	23.8	12	2.5	FPM
404-040-VS	4	G 1/8	6	8.8	13.5	23.8	12	2.5	NBR
406-158-VS	6	M8×1	6	11.7	13.2	30.5	12	3	NBR
406-158-VS	6	M8×1	6	11.7	13.2	30.5	12	3	NBR
406-004-VS	6	M10×1	6	11.7	13.5	27	12	4	NBR
406-004-S8-VS	6	M10×1	6	11.7	13.5	27	12	4	FPM
456-004-VS	6	G 1/8	6	11.7	13.5	27	12	4	NBR
456-004-VS	6	G 1/8	6	11.7	13.5	27	12	4	FPM
406-054-VS	6	G 1/4	7	11.7	16.4	28	12	4	NBR
406-162-VS	6	M12×1	7	11.7	15.4	28	14	4	NBR
406-162-S8-VS	6	M12×1	7	11.7	15.4	28	14	4	FPM
408-004-VS	8	M10×1	6	13.9	15.2	32.3	14	5	NBR
408-004-S8-VS	8	M10×1	6	13.9	15.2	32.3	14	5	FPM
408-162-VS	8	M12×1	7	13.9	15.2	32.8	14	6	NBR
408-162-S8-VS	8	M12×1	7	13.9	15.2	32.8	14	6	FPM
408-054-VS	8	G 1/4	7	13.9	16.4	30.8	14	6	NBR

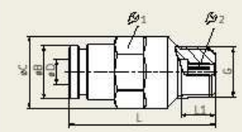
Figure 13



Adaptors with tapered thread (→ Figure 14)

Order No.	Tube øD	G	L1	ø B	ø C	L	⌀1	⌀2
451-004-462-VS	4	M6 tap.	5.5	8.8	11.5	25.8	10	2.5
451-004-471-VS	4	M6×1 tap.	5.5	8.8	11.5	25.8	10	2.5
451-004-498-VS	4	M8×1 tap.	5.5	8.8	11.5	23.3	10	2.5
451-004-518-VS	4	M10×1 tap.	5.5	8.8	11.5	22.8	10	2.5
404-673K-V1-VS	4	1/4-28 SAE LT	5.1	8.8	11.5	26.3	10	2.5
404-040K-V1-VS	4	1/8 NPTF	8	8.8	11.5	24.8	10	2.5
451-006-468-VS	6	M6 tap.	5.5	11.7	13.5	30	12	2.5
451-006-498-VS	6	M8×1 tap.	5.5	11.7	13.5	29.5	12	4
451-006-518-VS	6	M10×1 tap.	5.5	11.7	13.5	27	12	4
406-423W-VS	6	R 1/8	6.5	11.7	13.5	28.5	12	4
406-423N-VS	6	1/8 NPTF	7.5	11.7	13.5	28.5	12	4

Figure 14



Banjo fittings with with cylindrical thread (→ Figure 15)

Order No.	Tube øD	G	L1	ø B	L	L2	⌀1	⌀2	Seal
504-100-VS	4	M6×1	4.5	10	21.8	17.5	9	9	NBR
504-101-VS	4	M8×1	6	10	21.8	20.5	10	9	NBR
504-101-S8-VS	4	M8×1	6	10	21.8	20.5	10	9	FPM
504-102-VS	4	M10×1	6	10	21.8	20.5	12	9	NBR
504-102-VS	4	M10×1	6	10	21.8	20.5	12	9	NBR
504-102-S8-VS	4	M10×1	6	10	21.8	20.5	12	9	FPM
504-108-VS	4	G 1/8	6	10	21.8	20.5	12	9	NBR
504-108-S8-VS	4	G 1/8	6	10	21.8	20.5	12	9	FPM
506-139-VS	6	M8×1	6	12.5	26	21	10	10	NBR
506-139-S8-VS	6	M8×1	6	12.5	26	21	10	10	FPM
506-140-VS	6	M10×1	6	12.5	26	21	12	10	NBR
506-140-S8-VS	6	M10×1	6	12.5	26	21	12	10	FPM
506-108-VS	6	G 1/8	6	12.5	26	21	12	10	NBR
506-108-S8-VS	6	G 1/8	6	12.5	26	21	12	10	FPM
506-142-VS	6	M12×1	7	12.5	26	23	14	10	NBR
506-142-S8-VS	6	M12×1	7	12.5	26	23	14	10	FPM
506-143-VS	6	G 1/4	7	12.5	26	23	15	10	NBR
508-142-VS	8	M12×1	7	14.5	28.8	23	14	12	NBR
508-142-S8-VS	8	M12×1	7	14.5	28.8	23	14	12	FPM
508-143-VS	8	G 1/4	7	14.5	28.8	23	14	12	NBR

Banjo fittings with tapered thread (→ Figure 16)

Order No.	Tube øD	G	L1	ø B	L	L2	⌀1	⌀2	Seal
455-546-048-VS	4	M6 tap.	6	10	21.8	20	10	9	NBR
455-546-048-S8-VS	4	M6 tap.	6	10	21.8	20	10	9	FPM
455-529-048-VS	4	M8×1 tap.	6	10	21.8	20	10	9	NBR
455-529-048-S8-VS	4	M8×1 tap.	6	10	21.8	20	10	9	FPM
455-531-048-VS	4	M10×1 tap.	6	10	21.8	20	12	9	NBR
455-531-048-S8-VS	4	M10×1 tap.	6	10	21.8	20	12	9	FPM
455-569-048-VS	4	R 1/8	7.5	10	21.8	20.5	12	9	NBR
455-529-068-VS	6	M8×1 tap.	6	12.5	26	20	10	10	NBR
455-529-068-S8-VS	6	M8×1 tap.	6	12.5	26	20	10	10	FPM
455-531-068-VS	6	M10×1 tap.	6	12.5	26	20.5	12	10	NBR
455-531-068-S8-VS	6	M10×1 tap.	6	12.5	26	20.5	12	10	FPM
455-546-068-VS	6	M6×1 tap.	6	12.5	26	20.5	10	10	NBR
455-565-068-VS	6	R 1/4	11	12.5	26	24.5	14	10	NBR

Banjo fittings with banjo bolt and cylindrical thread (→ Figure 17)

Order No.	Tube øD	G	L1	ø B	L	L2	⌀	Seal
504-161-VS	4	M6	5	8.8	22.3	19.5	9	NBR
504-401-S1-VS	4	M5	5	8.8	21.8	18	8	NBR
504-411-VS	4	M8	7	8.8	23.8	20	12	NBR
504-401-VS	4	M8×1	7	8.8	23.8	20	12	NBR
504-103-VS	4	M10×1	7	8.8	24.8	22.5	14	NBR
445-519-041-VS	4	G 1/8	7	8.8	24.8	22.5	14	NBR

Figure 15

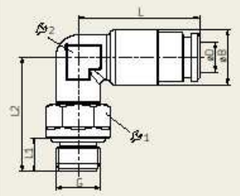


Figure 16

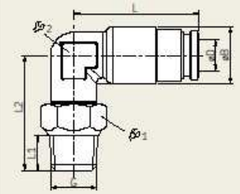
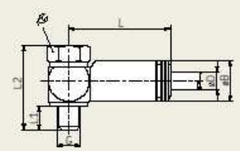


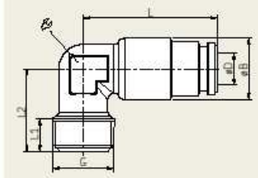
Figure 17



Elbows, with tapered thread

Order No.	Tube øD	G	L1	ø B	L	L2	⌀	Seal
453-004-471-VS	4	M6 tap.	6	10	21.8	14	9	NBR
453-004-471-S8-VS	4	M6 tap.	6	10	21.8	14	9	FPM
504-201-VS	4	M8×1 tap.	6	10	21.8	13.5	9	NBR
504-201-S8-VS	4	M8×1 tap.	6	10	21.8	13.5	9	FPM
504-202-VS	4	M10×1 tap.	6	10	21.8	13.5	9	NBR
504-202-S8-VS	4	M10×1 tap.	6	10	21.8	13.5	9	FPM
514-018-VS	4	R 1/8	7.5	10	21.8	15	9	NBR
514-018-S8-VS	4	R 1/8	7.5	10	21.8	15	9	FPM
504-200K-V1-VS	4	1/4-28 SAE LT	5.1	10	21.8	15.5	9	NBR
514-018K-V1-VS	4	1/8 NPTF	7	10	21.8	15	9	NBR
453-006-468-VS	6	M6 tap.	6	12.5	26	15	10	NBR
453-006-468-S8-VS	6	M6 tap.	6	12.5	26	15	10	FPM
506-508-VS	6	M8×1 tap.	6.5	12.5	26	14	10	NBR
506-508-S8-VS	6	M8×1 tap.	6.5	12.5	26	14	10	FPM
506-510-VS	6	M10×1 tap.	6	12.5	26	14	10	NBR
506-510-S8-VS	6	M10×1 tap.	6	12.5	26	14	10	FPM
506-511-VS	6	R 1/8	8.5	12.5	26	16.5	10	NBR
506-511-S8-VS	6	R 1/8	8.5	12.5	26	16.5	10	FPM
506-511K-V1-VS	6	1/8 NPTF	8.5	12.5	26	16.5	10	FPM
506-512-VS	6	M12×1 tap.	7	12.5	26	15	10	NBR
453-006-651-VS	6	R 1/4	11.5	12.5	26	19.5	10	NBR

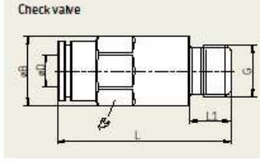
Elbow



Check valves

Order No.	Tube øD	G	Opening pressure [bar]	Pressure, max. [bar]	L1	ø B	L	⌀	Seal
VPKG-RV4-VS	4	R 1/8	3[1]	300	7.9	10	32.3	9	NBR
VPKM-RV-VS	6	M10×1 tap.	3[2]	300	8	13.5	33.5	12	NBR
VPKG-RV-VS	6	R 1/8	3[2]	300	8	13.5	33.5	12	NBR
SSV-RV-VS	6	M10×1	3[1]	300	6	12.8	41.3	12	NBR

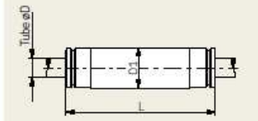
Check valve



Connectors

Order No.	Tube øD	D1	L	Seal
454-504-041-VS	4	10	38.5	NBR
406-426-VS	6	12	44.5	NBR

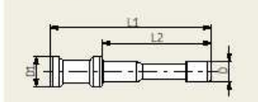
Connector



Locking pin

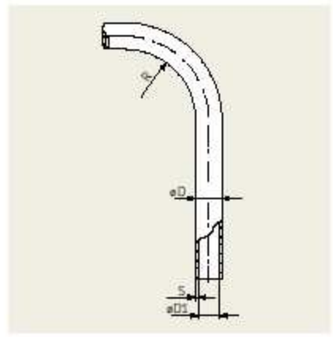
Order No.	Tube øD	D1	L1	L2
450-204-002	4	6	31	21
450-206-002	6	8	37	25

Locking pin



5.49. Secondary Distribution Lines – 4mm Plastic Tubing

Plastic tubing



Plastic tubing WVN715, semirigid (without plasticizer)

Order No. [2]	ø D [mm]	S [mm]	ø D1 $^{+0.15}_{-0.05}$ [mm]	Minimum bending radius R [mm] freehand	with fixture	Permissible operating pressure [1] at 23 °C [bar]	Burst pressure [bar]
WVN715-R02.5×0.5	2.5 ±0.1	0.5	1.5	25	9	66	198
WVN715-R04×0.85	4 ±0.1	0.85	2.3	38	14	72	216
WVN715-R06×1	6 ±0.1	1	4	63	21	53	159
WVN715-R06×1.25	6 ±0.1	1.25	3.5	63	21	70	210
WVN715-R08×1.25	8 ±0.1	1.25	5.5	76	28	49	147
WVN715-R010×1.5	10 ±0.15	1.5	7	89	35	47	141

Special scissor for plastic tubing, order No. 226-12508-5

1) The permissible operating pressure is lower at higher temperatures (→ the Pressure utilization factor table)
2) If resistance to light-aging is desired, add the word "BLACK" in the order number (example – WVN715-R08x1.25x50M SCHWARZ)

Plastic tubing WVN716, flexible (containing plasticizer)

Order No. [2]	ø D ±0,1 [mm]	S[mm]	ø D1 $^{+0.15}_{-0.05}$ [mm]	kleinster Biegeradius R [mm] frei gebogen	mit Vorrichtung	zulässiger Betriebsdruck [1] bei 23 °C [bar]	Berstdruck [bar]
WVN716-R04×0.85	4	0.85	2.3	38	14	36	108
WVN716-R06×1.25	6	1.25	3.5	63	21	35	105
WVN716-R08×1.25	8	1.25	5.5	80	30	25	75

1) The permissible operating pressure is lower at higher temperatures (→ the Pressure utilization factor table)
2) If resistance to light-aging is desired, add the word "BLACK" in the order number (example – WVN716-R08x1.25x50M SCHWARZ)

Pressure utilization factor

Temperature up to [°C]	Pressure efficiency [%]
30	83
40	72
50	64
60	57
70	52
80	47

Technical Data

WVN715	PA 12 H polyamide 12, semirigid, unplasticized as per DIN 73378, stabilized against heat and aging.	PA 12 HL (black tubing) polyamide 12, semirigid, unplasticized as per DIN 73378, stabilized against light, heat and aging.
WVN716	PA 12 PH polyamide 12, flexible, containing plasticizer as per DIN 73378, stabilized against heat and aging.	PA 12 PHL (black tubing) polyamide 12, flexible, containing plasticizer as per DIN 73378, stabilized against light, heat, and aging.
Temperature range	–60 to +80 °C	–60 to +80 °C