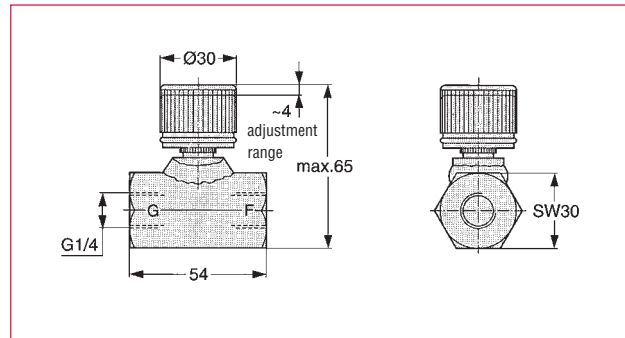
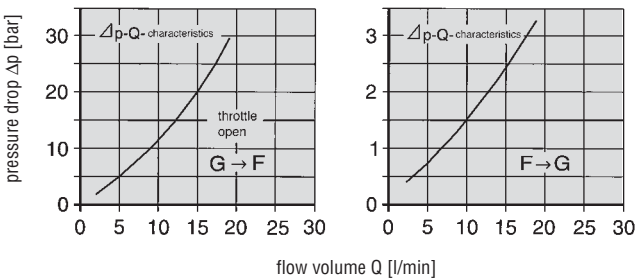
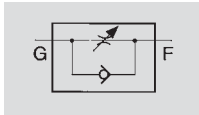


Hydraulic throttle valve with reverse free flow

Max. operating pressure 500 bar

Hydraulic throttle valves are used as restrictor valves in hydraulic systems. Their flow resistance is changed by adjusting the diameter of the restrictor; this regulates the flow volume. In the opposite flow direction, the flow is not restricted.

Symbol



Order no.	Design	Mounting position	Max. operating pressure [bar]	Max. flow Q [l/min]	Flow direction throttled	Flow direction free	Temperature range oil and surroundings	Weight ~ [kg]
70981-D	cone flow control valve with by-pass back pressure valve	optional	500	ca. 15	G R F	F R G	-40...+80°C	0,37

Hydraulic opening valve, direct control

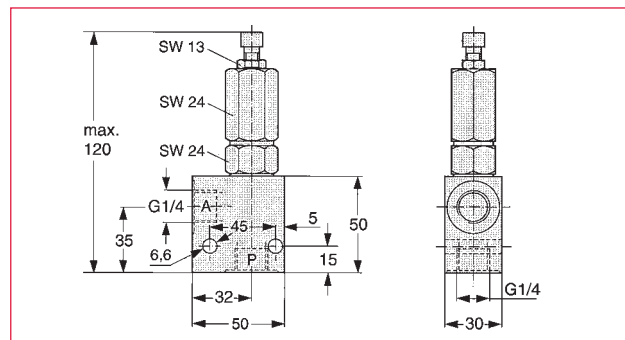
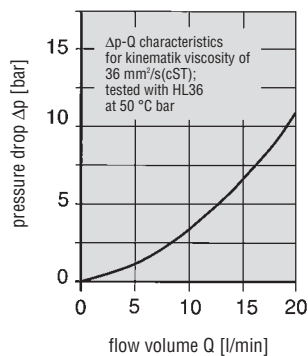
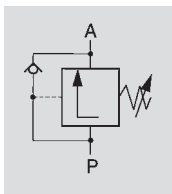
Max. operating pressure 350 bar

The use of hydraulic opening valves is recommended in applications where 2 or more hydraulic cylinders have to be operated in sequence or where workpieces have first to be positioned and then clamped.

Function

Hydraulic opening valves are mounted into the feed line of hydraulic cylinders which have to be actuated with a delay. Opening valves only open when the pre-set pressure is achieved or exceeded.

Symbol



Order no.	Design	Mounting position	Max. operating pressure [bar]	Setting range [bar]	Perm. temperature range	Weight ~ [kg]
70982-D1	sliding piston valve	optional	350	ab 20...250	-20°C...+70°C	0,7

Hydraulic valves

Back pressure valve with hydraulic release

Max. operating pressure 700 bar

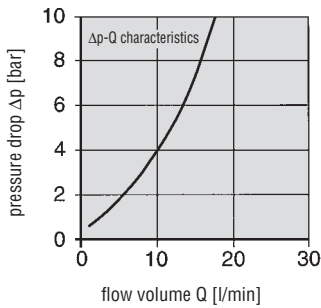
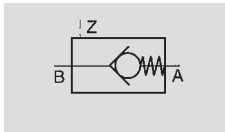
Back pressure valves serve to avoid pressure drop in pressurised cylinders as a result of leakage in the directional control slide valve. Furthermore, back pressure valves are used where hydraulic cylinders must be blocked for safety reasons in case of control valve failure.

Function

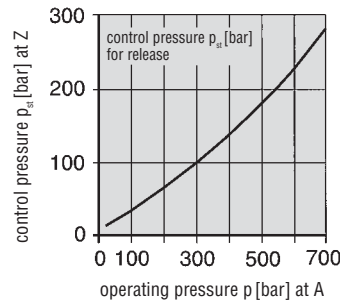
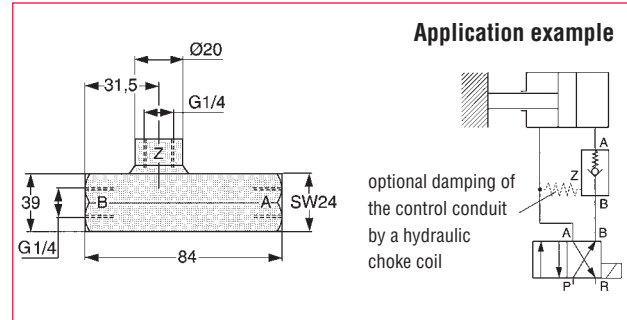
Flow direction A R B blocked, B R A open.

The flow direction A R B (blocked) can be released by hydraulic pressure to Z.

Symbol



applies to:
low direction B R A
and released
flow direction A R B
opening pressure
B R A 0.2 ... 0.3 bar
oil viscosity during
the test 60 mm²/s(cSt)



control pressure p_{st} [bar]
for release

$$p_{st} = p_B + \Delta p + k$$

p_B [bar] = pressure on side B
 Δp [bar] = flow resistance
A R B according to
 Δp -Q-characteristics
 $k = 10$

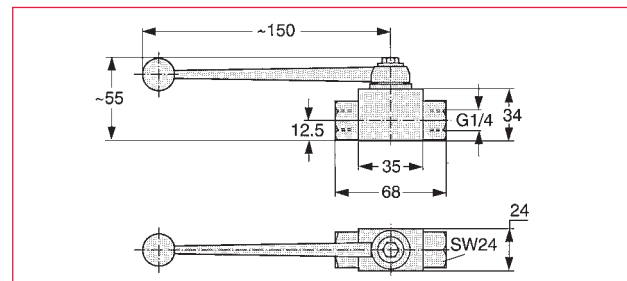
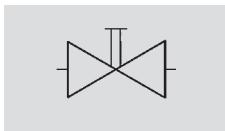
Order no.	Design	Mounting position	Max. operating pressure [bar]	Max. flow volume Q [l/min]	Temperature range oil and surroundings	Weight ~ [kg]
70983-D	spring loaded, hermetically sealed ball seat valve	optional, mounted into the tube conduit	700	ca. 15	-40°...+80°C	0,32

Hydraulic high pressure shut-off valve

Max. operating pressure 500 bar

Hydraulic high pressure shut-off valves are used for blocking hydraulic lines, e.g. in case one or more cylinders in a hydraulic clamping circuit must be temporarily shut-off.

Symbol



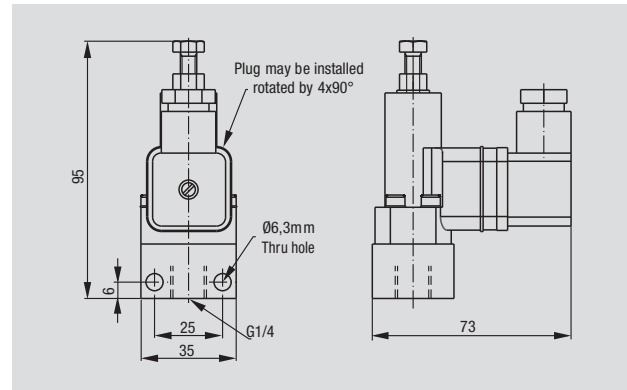
Order no.	Max. operating pressure [bar]	housing	Material			Actuation and function	Weight ~ [kg]
			ball and shaft	ball seal	shaft seal		
70984-D	500	steel	steel chromed	polyamide	perbunan	hand lever can be mounted in four positions up to (90°), optional flow direction, maintenance free operation	0,4

Electro-hydraulic piston pressure switch

Electro-hydraulic pressure switches are devices which close or open electrical contacts when pressurized. They are usually used for all applications where a electrical signal should be triggered whenever the set pressure is achieved or exceeded. This signal may be utilized to start a subsequent operation cycle or to stop an operation cycle.

Recommended accessories:

- Straight screw connection D8S-R1/4



Model no.	Operating pressure [bar]	Temperature range [°C]	Mounting position	Switching precision	Max. switching frequency [l/min]	Protection	Permitted current load	Weight [kg]
70-DG34-1/4	100-400	-20 to +80	any	± 2 ... 3 %	30	IP65	4A	0,4

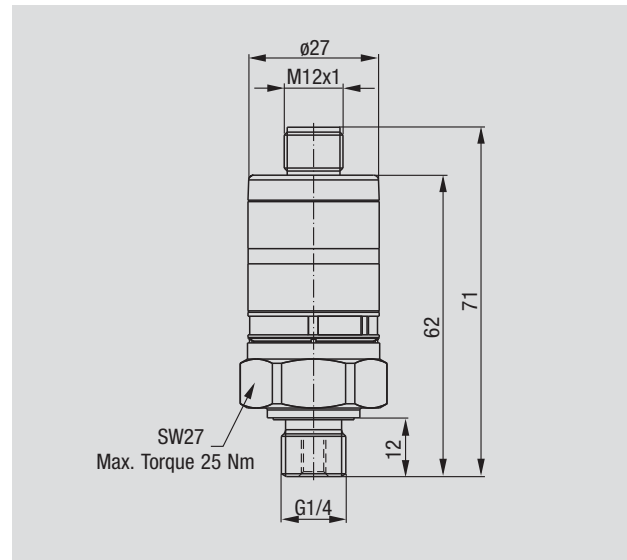
Electronic pressure switch

The electronic pressure switch apply wire strain gauges with full bridge circuitry. The adaptation and evaluation of the signal output is via analogous electronics.

Two fully-electronic PNP-outlets (switching plus)
Two LED's (yellow) as switching status indicators
adjustment via 2 rings with scales

Recommended accessories:

- Gauge screw connection MV8S
- Connection socket 4-pin M12x1 (5m cable) 8EL-003-1



Model no.	Operating pressure [bar]	Temperature range [°C]	Mounting position	Switching precision	Hysteresis	Protection	Voltage [VDC]	Permitted current load [mA]	Weight [kg]
70-DG64-1/4	0-400	-25 to +80	any	± 2,5%	2%	IP67	9,6 ... 32	max. 500	0,08

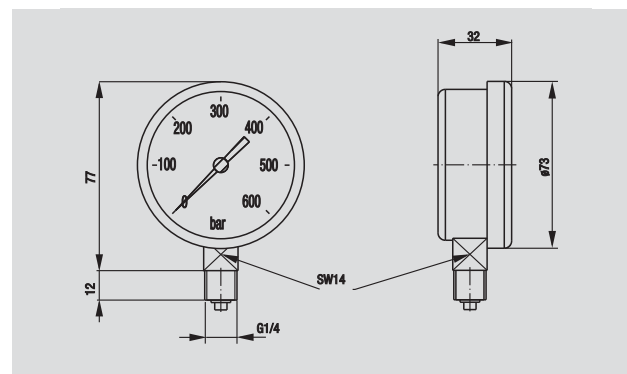
Hydraulic gauge with glycerin filling

Max. operating pressure 0-600 bar

Recommended accessories:

- Gauge screw connection MV8S

Model no.	Operating pressure [bar]	Connection	Weight ~ [kg]
70925-214	0-600	unten	0,25

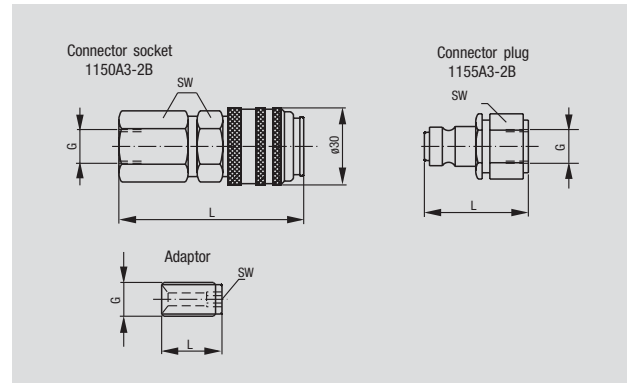


Hydraulic accessories

Hydraulic quick connectors

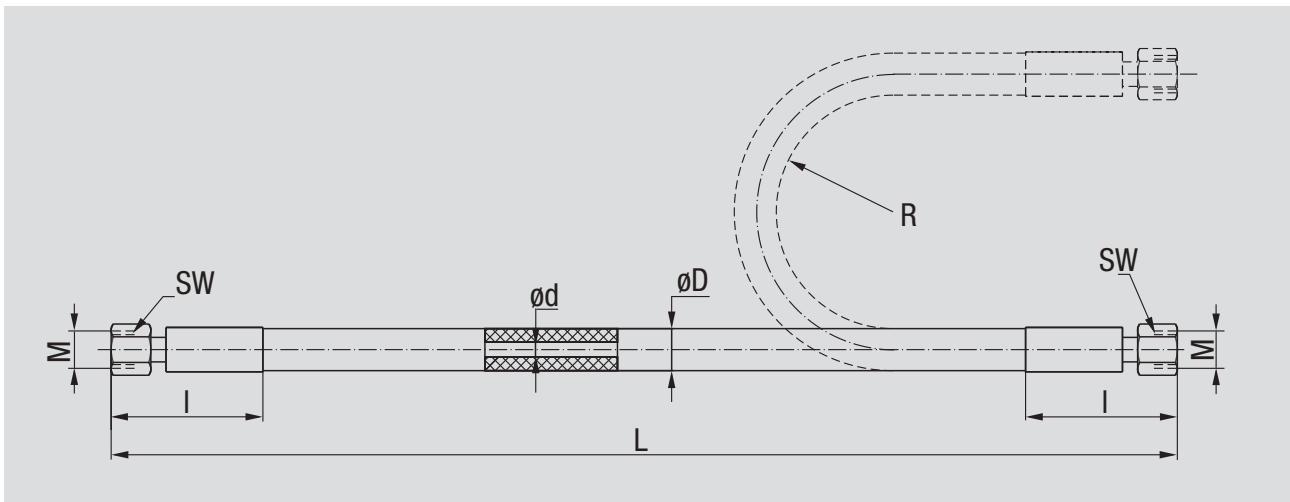
Technical characteristics:

- Minimal pressure drop due to unobstructed flow
- Drip free connection or disconnection
- Automatic safety function
- Dust cap supplied as standard



Model no.	max. Operating pressure		Flow volume [l/min]	Temperature range [°C]	Length ~L [mm]	Connection		Weight [kg]
	connected [bar]	disconnected [bar]				G [mm]	SW [mm]	
1150A3-2B	1000	1000	6	6	72,5	G1/4	24	0,3
1155A3-2B	1000	1000	6	6	41	G1/4	22	0,1
1184-2B	1000	1000	6	6	23,5	G1/4	5	0,02

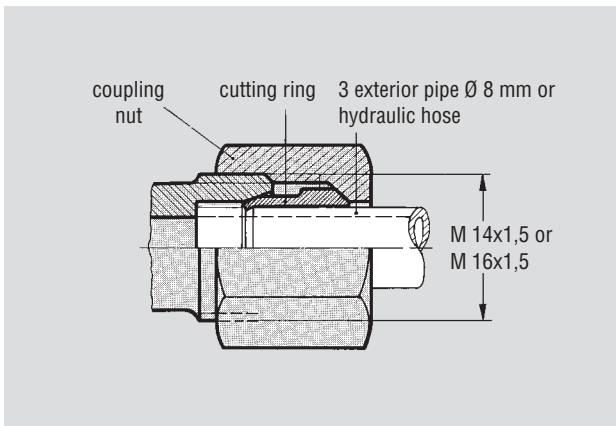
Hydraulic high pressure hose



Model no.	Nominal width NW	Operating pressure max. [bar]	Internal-Ø [mm]	External-Ø [mm]	Connector thread M	Total length*			Bendradius R min.	Weight [kg]
						~l [mm]	~L [mm]	SW [mm]		
6-301-300S	6	500	6,4	18	M16x1,5	65	300	19	150	0,3
6-301-600S	6	500	6,4	18	M16x1,5	65	600	19	150	0,4
6-301-900S	6	500	6,4	18	M16x1,5	65	900	19	150	0,6
6-301-1200S	6	500	6,4	18	M16x1,5	65	1200	19	150	0,7
6-301-1500S	6	500	6,4	18	M16x1,5	65	1500	19	150	0,8

* special lengths on request

Hydraulic accessories



Screw connections

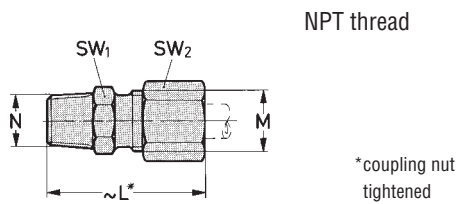
For pipe, exterior diameter 8 and hydraulic hoses

Screw connection, standard application

(coupling nut M14x1,5 or M16x1,5 and cutting ring are removable).

The permitted operating pressure is:

- L-screw connections R1/8 max. **200** bar (e.g. D8L-R1/8)
- L-screw connections R1/4 max. **250** bar (e.g. D8L-R1/4)
- S-screw connections max. **630** bar (e.g. D8S-R1/4)

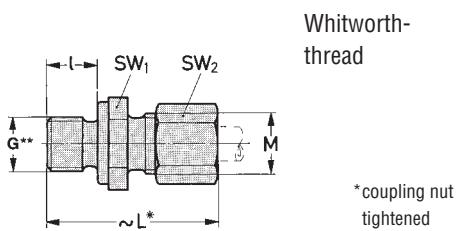


NPT thread

*coupling nut tightened

Straight screw connection

Order no.	~L*	M	N	SW1	SW2	Weight ~ [kg]
D8L-1/8NPT	31,5	M14x1,5	1/8NPT	14	17	0,034
D8L-1/4NPT	36,5	M14x1,5	1/4NPT	14	17	0,038
D8S-1/4NPT	42,5	M16x1,5	1/4NPT	17	19	0,063

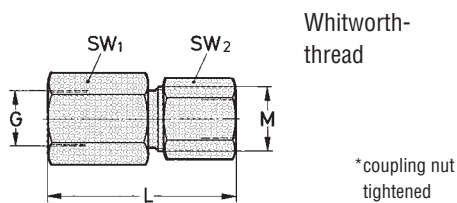


Whitworth thread

*coupling nut tightened

Straight screw connection

Order no.	I	~L*	M	G	SW1	SW2	Weight ~ [kg]
D8L-R1/8	8	31	M14x1,5	G1/8	17	17	0,036
D8L-R1/4	12	36,5	M14x1,5	G1/4	19	17	0,045
D8S-R1/8	8	39	M16x1,5	G1/8	17	19	0,055
D8S-R1/4	12	42	M16x1,5	G1/4	19	19	0,063

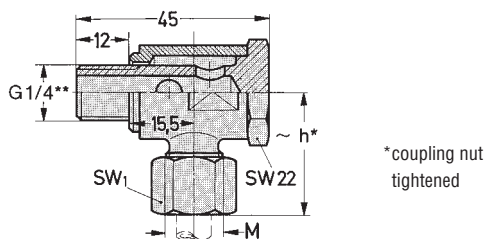


Whitworth thread

*coupling nut tightened

Straight screw connection

Order no.	~L*	M	G	SW1	SW2	Weight ~ [kg]
GA18-LR	39	M14x1,5	G1/4	19	17	0,045
GA18-SR 1	41	M16x1,5	G1/4	19	19	0,055

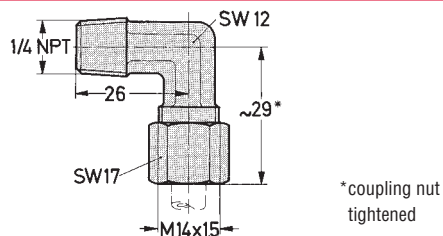


*coupling nut tightened

L-screw connection, adjustable

Order no.	~h*	M	SW1	Weight ~ [kg]
DSVK-8LR	28,8	M14x1,5	17	0,09
DSVK-8SR¹⁾	30,5	M16x1,5	19	0,09

¹⁾ permitted operating pressure max. 400 bar

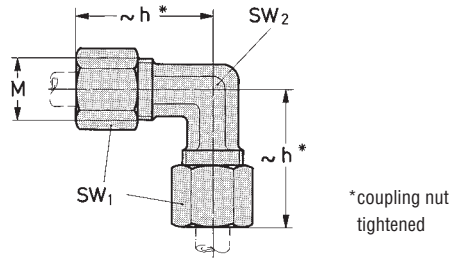


*coupling nut tightened

L-screw connection

Order no. G8L-1/4NPT	Weight 0,047 kg
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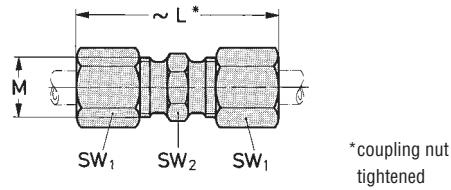
Screw connections



Screw connection, standard applications

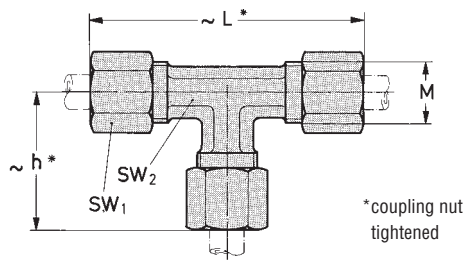
L-screw connection

Order no.	~h*	M	SW1	SW2	Weight ~ [kg]
K8L	29	M14x1,5	17	12	0,06
K8S	31,5	M16x1,5	19	19	0,06



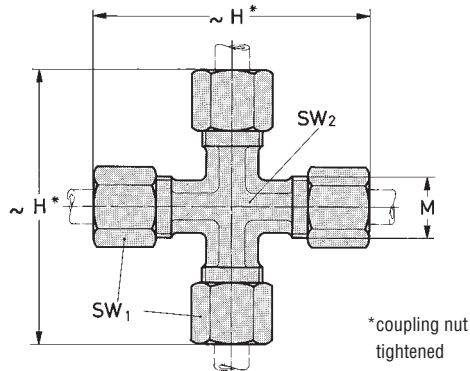
straight screw connection

Order no.	~L*	M	SW1	SW2	Weight ~ [kg]
E8L	40	M14x1,5	17	14	0,05
E8S	47	M16x1,5	19	17	0,05



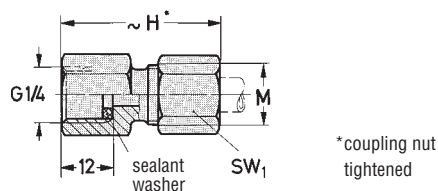
T-screw connection

Order no.	~h*	~L*	M	SW1	SW2	Weight ~ [kg]
Q8L	29	57	M14x1,5	17	12	0,09
Q8S	31,5	63	M16x1,5	19	14	0,09



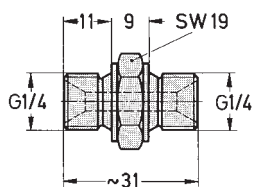
Cross screw connection

Order no.	~H*	M	SW1	SW2	Weight ~ [kg]
KV8L	57	M14x1,5	17	12	0,12
KV8S	63	M16x1,5	19	14	0,12



Gauge screw connection

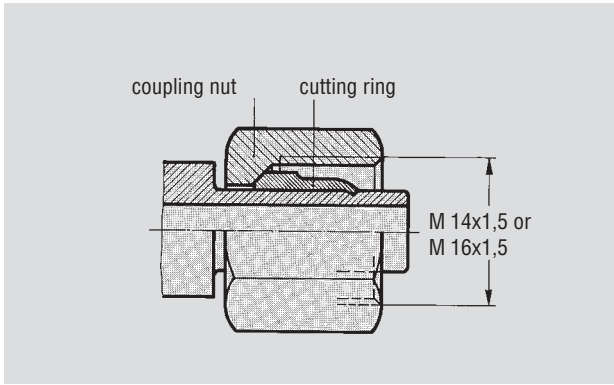
Order no.	~H*	M	SW1	Weight ~ [kg]
MV8L	34	M14x1,5	17	0,05
MV8S	36	M16x1,5	19	0,05



Twin nipple

Order no. R-1/4-1/4	Weight 0,04 kg
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Hydraulic accessories



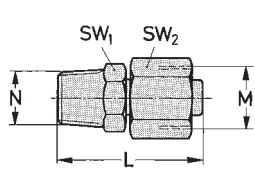
Screw connections

Screw connections, pre-assembled

(the coupling nut M14x1,5 or M16x1,5 and the cutting ring are pre-assembled).

The permitted operating pressure is:

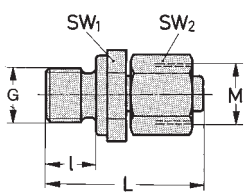
- L-screw connections R1/8 max. **200** bar (e.g. D8L-R1/8)
- L-screw connections R1/4 max. **250** bar (e.g. D8L-R1/4)
- S-screw connections max. **630** bar (e.g. D8S-R1/4)



NPT thread

Straight screw connection, pre-assembled

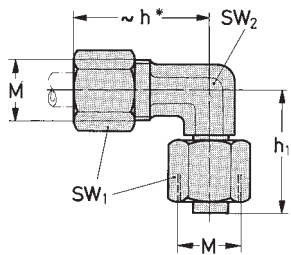
Order no..	L	M	N	SW1	SW2	Weight ~ [kg]
DC8L-1/4NPT	34	M14x1,5	1/4NPT	14	17	0,035
DC8S-1/4NPT	40	M16x1,5	1/4NPT	14	19	0,05



Whitworth-thread

Straight screw connection, pre-assembled

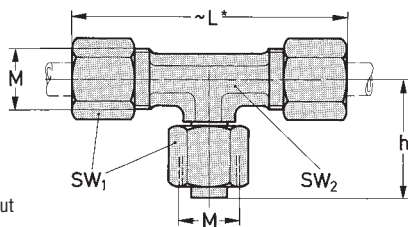
Order no.	l	L	M	G	SW1	SW2	Weight ~ [kg]
DC8L-R1/8	8	35	M14x1,5	G1/8	14	17	0,038
DC8L-R1/4	12	37	M14x1,5	G1/4	19	17	0,045
DC8S-R1/4	12	42	M16x1,5	G1/4	19	19	0,055



*coupling nut tightened

L screw connection, pre-assembled

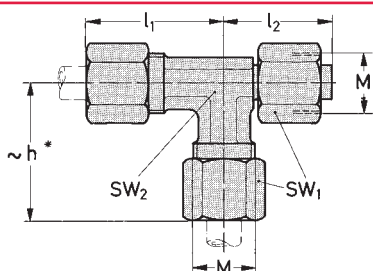
Order no.	~h*	h ₁	M	SW1	SW2	Weight ~ [kg]
KE8L	29	27	M14x1,5	17	12	0,06
KE8S	31,5	30	M16x1,5	19	14	0,06



*coupling nut tightened

T screw connection, pre-assembled

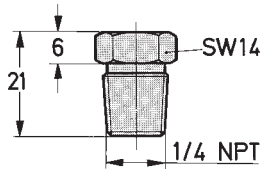
Order no.	h	~L*	M	SW1	SW2	Weight ~ [kg]
QE8L	27	57	M14x1,5	17	12	0,08
QE8S	30	63	M16x1,5	19	14	0,08



*coupling nut tightened

T screw connection, pre-assembled

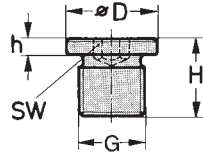
Order no.	~h*	l ₁	l ₂	M	SW1	SW2	Weight ~ [kg]
LE8L	29	29	27	M14x1,5	17	12	0,08
LE8S	31,5	31,5	30	M16x1,5	19	14	0,08



Blanking plug

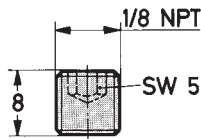
Order no. **70956**

Weight 0,023 kg



Blanking plug

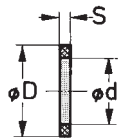
Order no.	$\varnothing D$	h	H	G	SW	Weight ~ [kg]
70215-09	14	3	11,5	G1/8	5	0,007
70230-09	18	3	15	G1/4	6	0,014



Blanking plug

Order no. **702158**

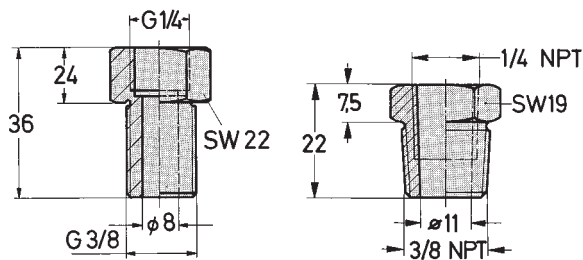
Weight 0,004 kg



for screw-in connection with whitworth thread

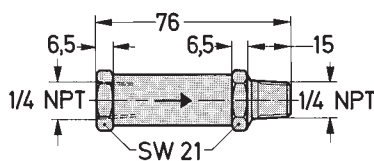
Copper seal ring

Order no.	$\varnothing d$	$\varnothing D$	s	for	Weight ~ [kg]
70200-01	10	15	1,5	G1/8	0,002
70200-02	13	18	1,5	G1/4	0,002



Reducing nipple

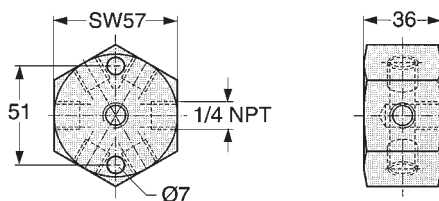
Order no.	Order no. whitworth thread	Weight ~ [kg]
GWR-3/8-1/4	pipe thread	0,003
PTRS-1/4NPT	NPT thread	0,002



Back pressure valve

Order no. **70923**

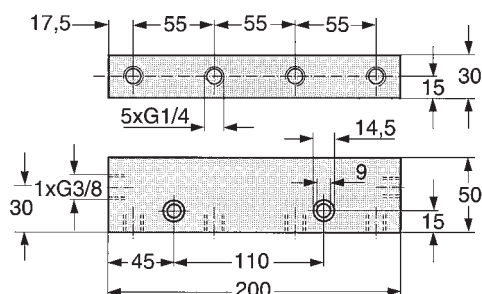
Weight 0,125 kg



Manifold

Order no. **70901**

Weight 0,42 kg



1 reducing nipple GWR-3/8-1/4 included

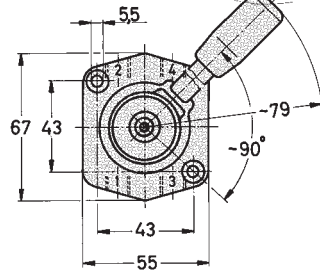
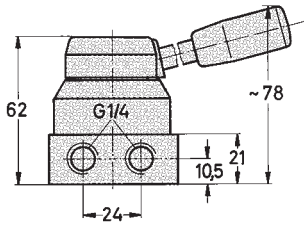
Manifold, in time

Order no. **794J06001-1**

Weight 2,1 kg

Pneumatic accessories

top view

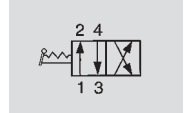


4/2-way manual control valve, G1/4 connection

order no. **800414**

Symbol

weight 0,4 kg

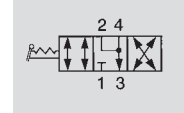


4/3-way manual control valve, G1/4 connection

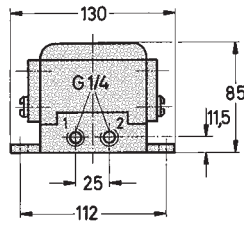
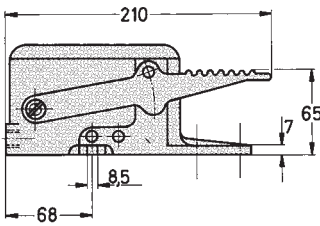
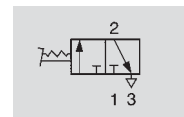
order no. **800415**

Symbol

weight 0,4 kg



Symbol

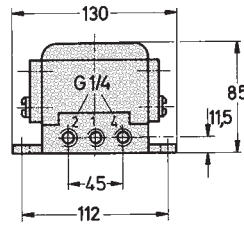
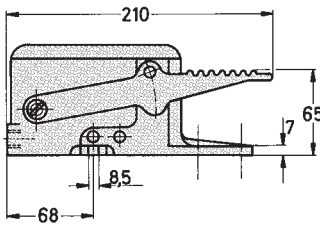
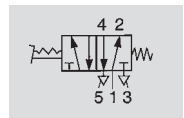


3/2-way foot control valve, G1/4 connection (with locking notch)

order no. **FP-3-1/4-B**

weight 1,76 kg

Symbol

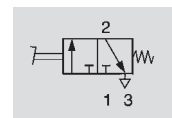


5/2-way foot control valve, G1/4 connection (with locking notch)

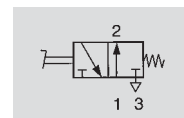
order no. **FP-5-1/4-B**

weight 1,95 kg

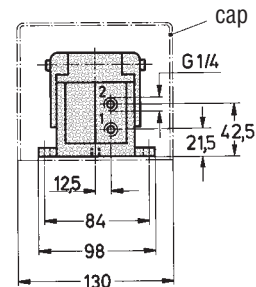
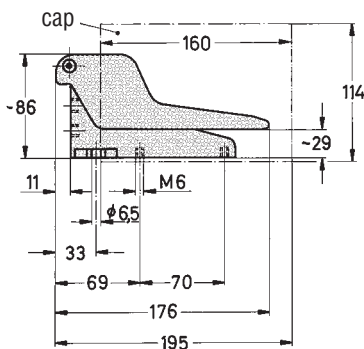
Symbol



F-3-1/4-B
F-3-1/4-H



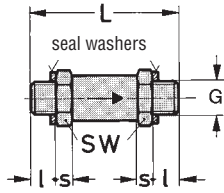
FO-3-1/4-B
FO-3-1/4-H



F-design: flow blocked in zero position
FO-design: flow open in zero position

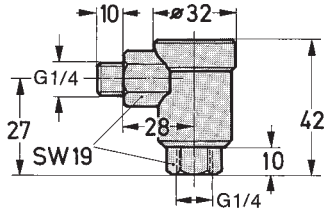
3/2-way foot control valve, G1/4 connection

Order no.	Order no.	Cover	Weight ~ [kg]
F-3-1/4-B	FO-3-1/4-B	with	1,2
F-3-1/4-H	FO-3-1/4-H	without	1,8



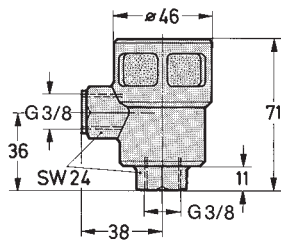
Back pressure valve

Order no.	l	L	G	s	SW	Weight ~ [kg]
H-1/4-A	8	50	G1/8	6	22	0,1
H-3/8-A	11	54	G3/8	7	22	0,11



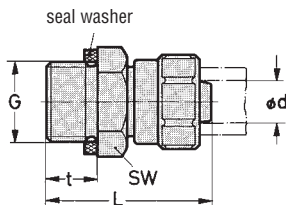
Quick vent valve with sound dampener, G1/4

Order no. SEU-1/4	Weight 0,11 kg
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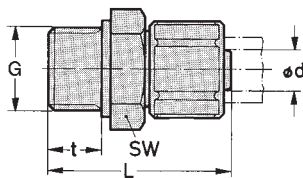
Quick vent valve with sound dampener, G3/8

Order no. SEU-3/8	Weight 0,175 kg
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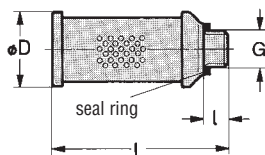
Pneumatic fitting

Order no.	L	G	SW	T	For plastic tube, inner Ø d	Weight ~ [kg]
CK-1/8-PK6	25	G1/8	13	7	6	0,006
CK-1/4-PK6	27	G1/4	17	9	6	0,009
CK-1/4-PK9	30	G1/4	17	9	9	0,015
CK-3/8-PK6	29	G3/8	19	10	6	0,013
CK-3/8-PK9	32	G3/8	19	10	9	0,016



Pneumatic fitting (plastic)

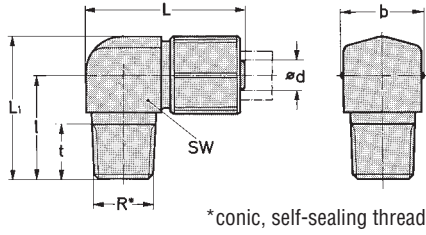
Order no.	L	G	SW	T	For plastic tube, inner Ø d	Weight ~ [kg]
CK-1/8-6KU	25,5	G1/8	13	6,5	6	0,004
CK-1/4-6KU	28,5	G1/4	17	8,5	6	0,005



Sound dampener

Order no.	ØD	l	L	G	Weight ~ [kg]
U-1/4	19	10	58	G1/4	0,01
U-3/8	35	11	82	G3/8	0,038

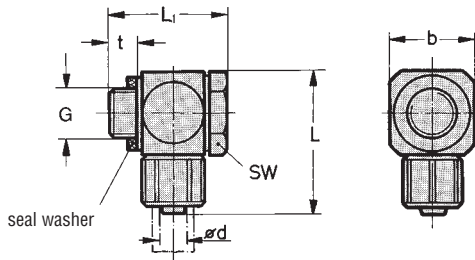
Pneumatic accessories



*conic, self-sealing thread

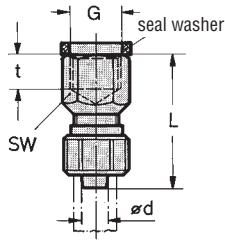
L-pneumatic fittings (plastic)

Order no.	b	L	L1	l	R*	SW	t	For plastic tube, inner \varnothing d	Weight ~ [kg]
GCK-1/8-6KU	14	29	24,5	17,5	R1/8	14	8	6	0,005
GCK-1/4-6KU	14	32,5	27,5	20,5	R1/4	14	11	6	0,009



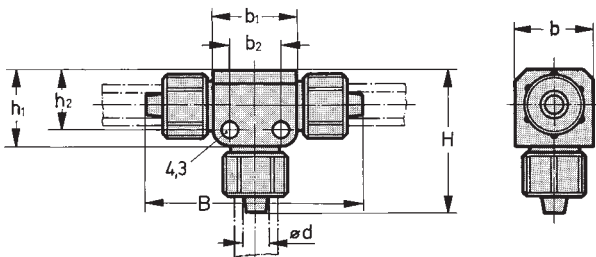
L-pneumatic fitting, swivel

Order no.	b	L	L1	G	SW	t	For plastic tube, inner \varnothing d	Weight ~ [kg]
LCK-1/4-PK6	19	34	28,5	G1/4	17	8	6	0,016
LCK-3/8-PK9	25	42	36,5	G3/8	22	12	9	0,043



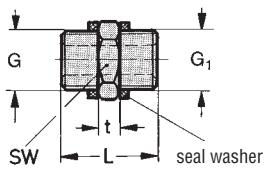
Pneumatic fitting

Order no.	L	G	SW	t	For plastic tube, inner \varnothing d	Weight ~ [kg]
ACK-1/4-PK6	33	G1/4	17	12	6	0,011
ACK-3/8-PK9	38	G3/8	19	18	9	0,016



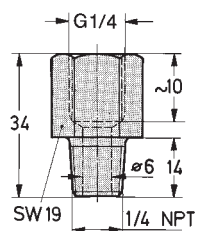
T-fitting (plastic)

Order no.	B	b	b1	b2	H	h1	h2	For plastic tube, inner \varnothing d	Weight ~ [kg]
FCK-3-PK6	52	18	20	12	34	18	14	6	0,014
FCK-3-PK9	64	22	21	13	46	22	22	9	0,028



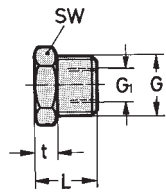
Twin nipple

Order no.	L	G	G1	t	SW	Weight ~ [kg]
E-1/4-1/4	23	G1/4	G1/4	5	17	0,008
E-1/4-3/8	25	G1/4	G3/8	5	19	0,010
E-3/8-3/8	27	G3/8	G3/8	5	19	0,010



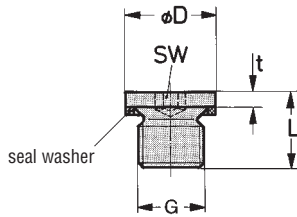
Connector

Order no. R1/4-1/4NPT	Weight 0,043 kg
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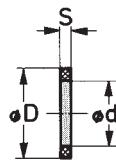
Reducing nipple

Order no.	L	G	G1	t	SW	Weight ~ [kg]
D-1/8I-1/4A	11	G1/4	G1/8	4	17	0,008
D-1/4I-3/8A	15	G3/8	G1/4	4	19	0,014
D-3/8I-1/2A	18	G1/2	G3/8	6	24	0,025



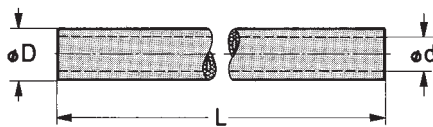
Blanking plug

Order no.	ØD	L	G	SW	t	Weight ~ [kg]
B-1/4	18	15	G1/4	6	3	0,015
B-3/8	22	15	G3/8	8	3	0,023



Plastic seal

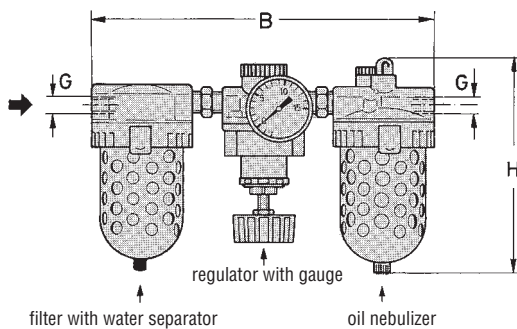
Order no.	Ød	ØD	s	For	Weight ~ [kg]
0-1/4	13	18	2	G1/4	0,001
0-3/8	17	22	2	G3/8	0,001



Plastic tube

Order no.	Ød	ØD	L	For fitting	Weight ~ [kg]
PK-6	6	8,5	per meter	G1/8, G1/4, G3/8	0,025
PU-6*	5,9	8,3		G1/8, G1/4, G3/8	0,033
PL-9	9	11,5		G3/8, G1/4	0,05

* flexible version



standard accessories: **angle for wall fastening**

Maintenance unit

information: The flow volume is based on 6 bar output pressure and a pressure drop of 0,5 bar. Adjustment range of the pressure regulator: 0,35-8,5 bar

All units have polycarbonate containers which can be used up to a pressure of 14 bar

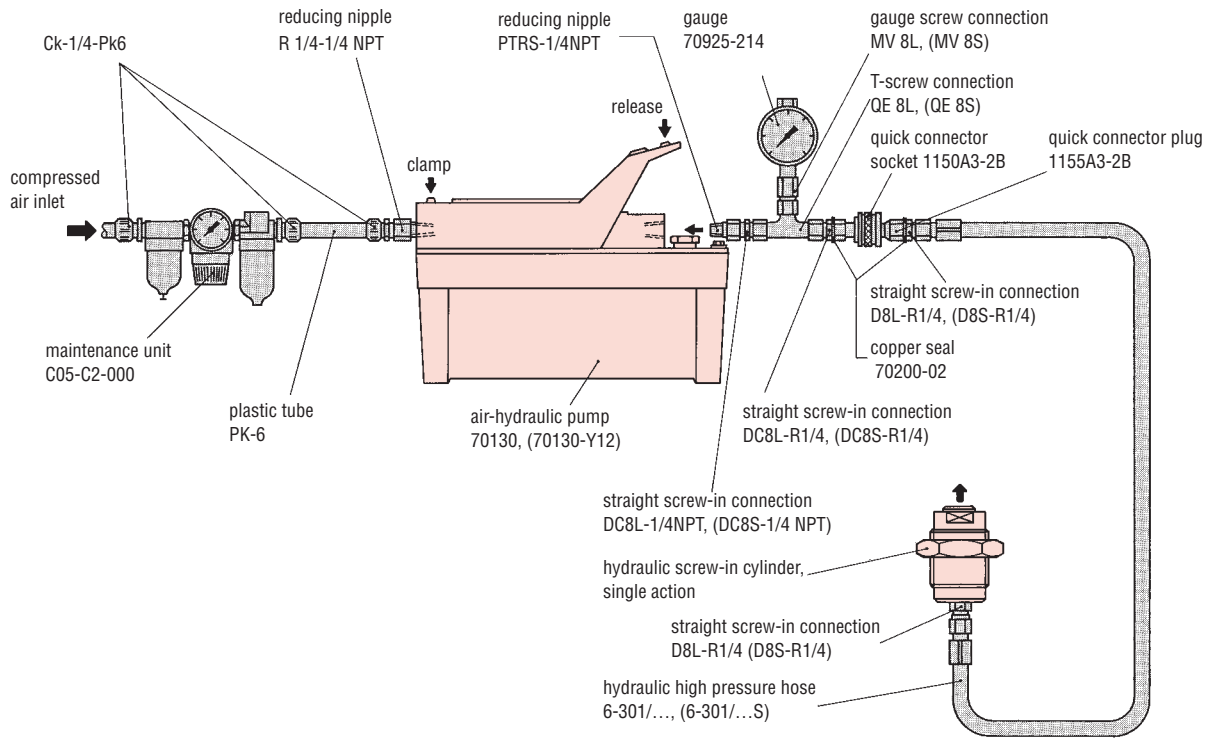
Recommended oil: light spindle oil of approx. 13-21 cSt (2-3°E) at 50°C.

Maintenance unit

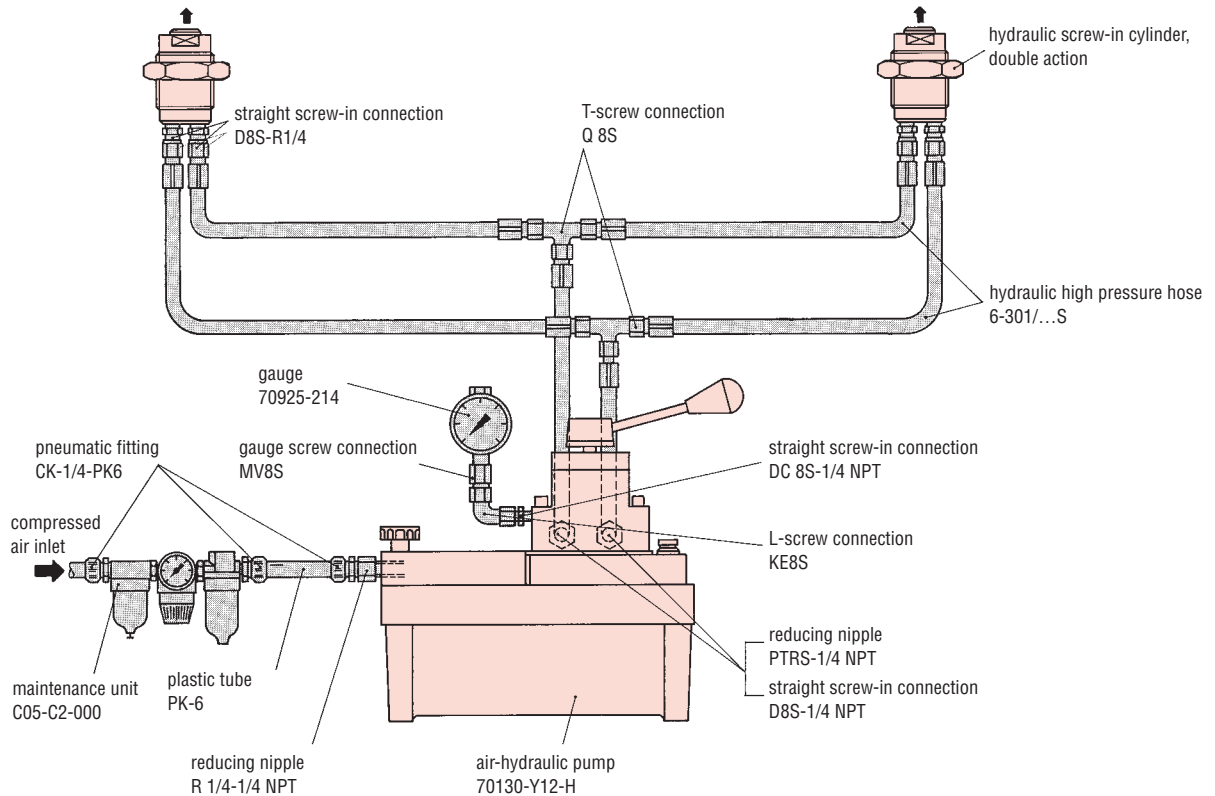
Order no.	B	H	G 2x	Flow volume [Nm³/h]	Weight ~ [kg]
C05-C2-000	145	116	G1/4	40	0,67
C16-C3-000	228	180	G3/8	75	2,2

Connection examples

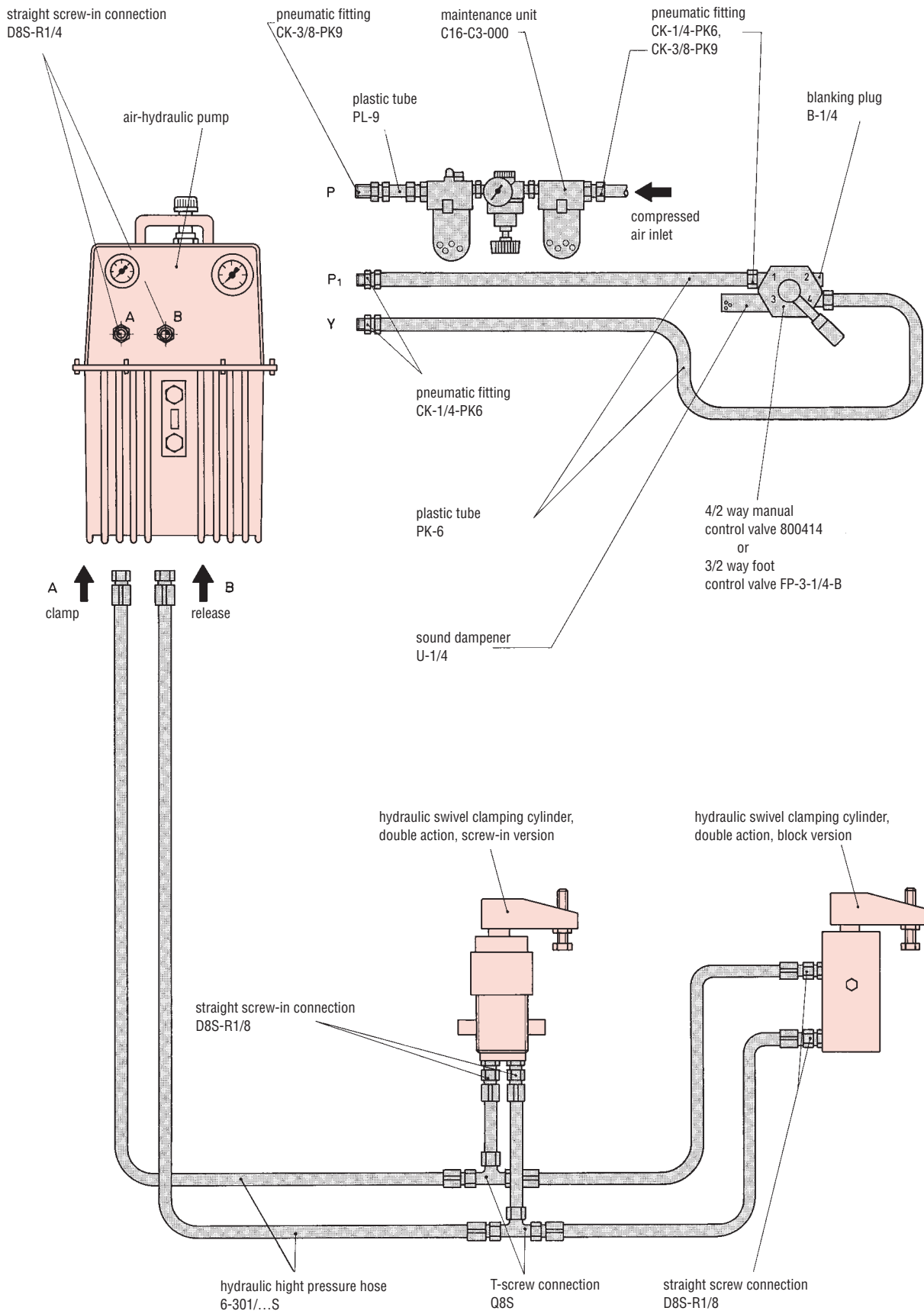
1. Connection example, single action

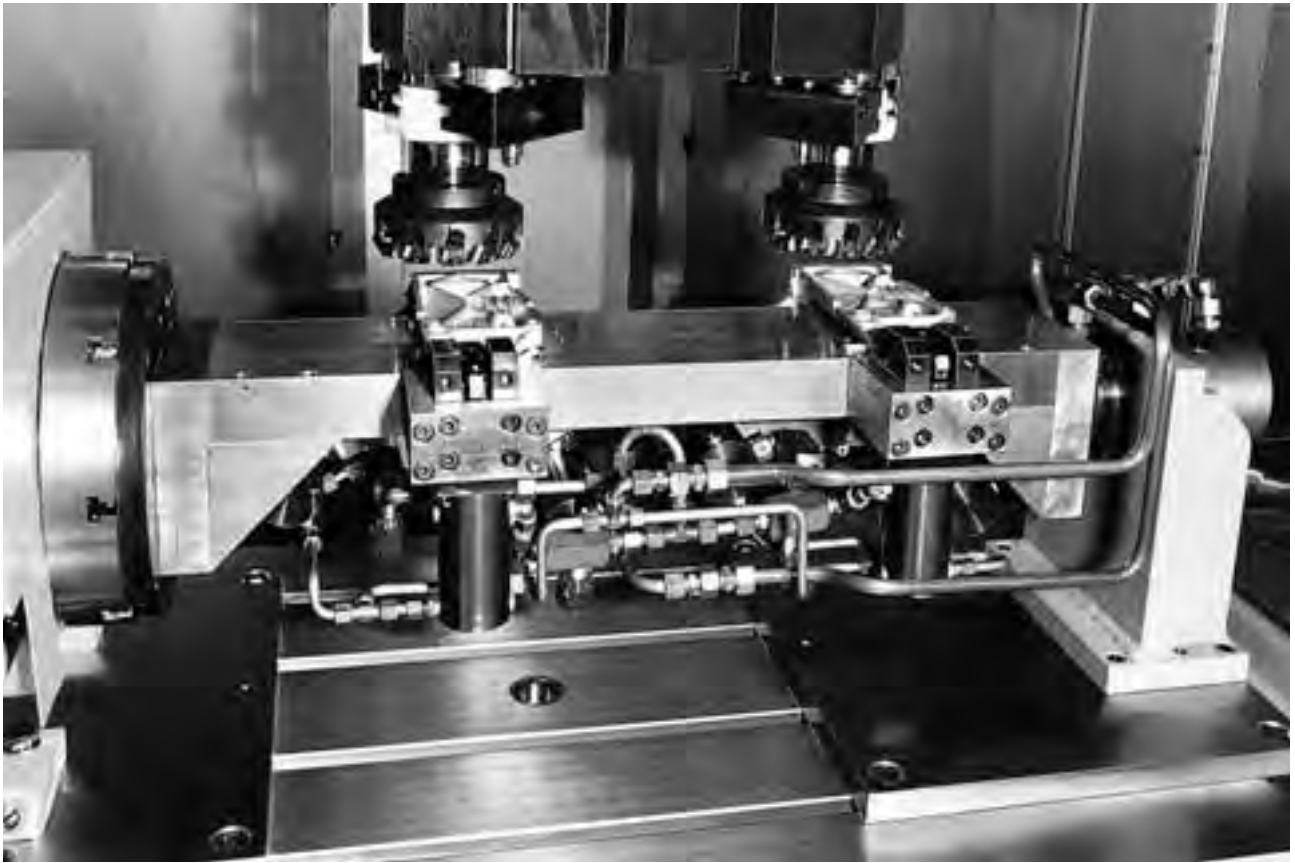


2. Connection example, double action



3. Connection example, **double action**





Hydraulic power clamp, double action (page 24.6) on a milling fixture



Hydraulic hollow piston cylinder, single action
(see catalogue pages 23.13 and 23.14) for clamping on a
drilling jig.



Hydraulic swivel clamp, double action
(see catalogue pages 24.1 to 24.4) for clamping cast parts on a
milling fixture



Hydraulic screw-in cylinder, double action
 (see catalogue pages 23.1 and 23.2) for clamping profiles fixed on a milling machine.



Hydraulic hollow piston cylinder, single action
 (see catalogue pages 23.13 and 23.14) as a clamping device on a milling machine.



Hydraulic hollow piston cylinder, single action
 (see catalogue pages 23.13 to 23.14) for clamping on a milling jig.



Hydraulic Edge clamp, single action
 (page 24.7 to 24.8) for clamping on a milling machine.



Hydraulic retraction clamp, double action
 (catalogue page 24.5) for clamping a mould tool to an injection mould machine.