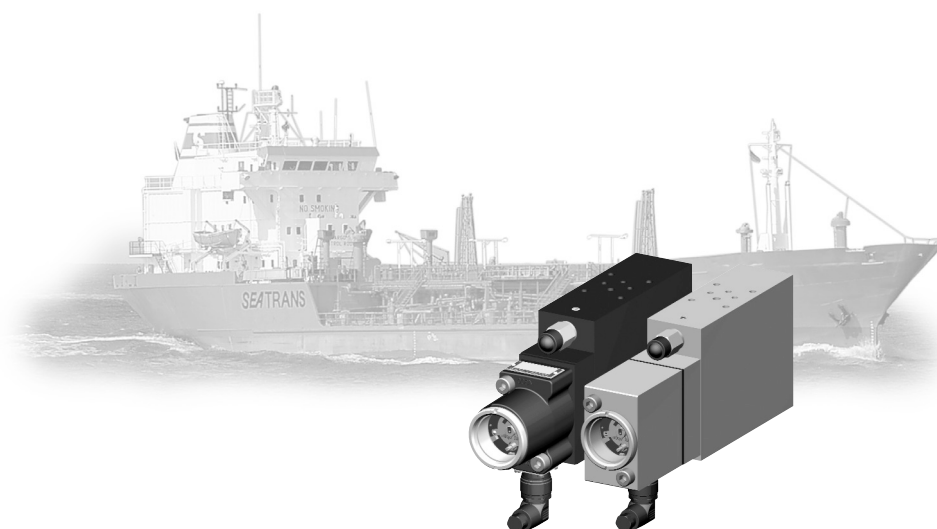


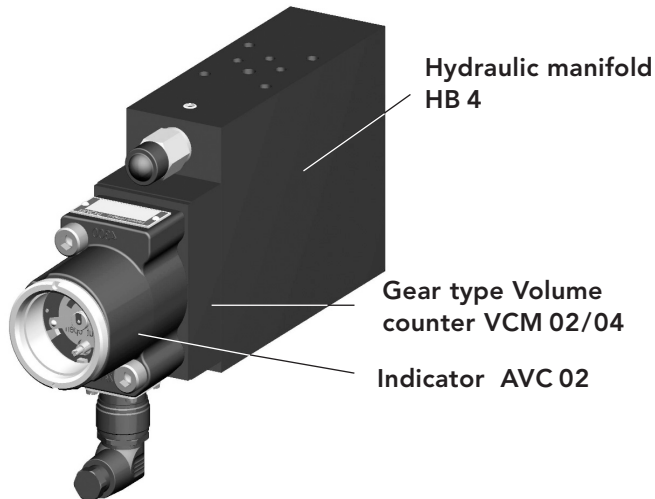
KRACHT



VOLUMEK

Valve Position Indicator 02/04

Description



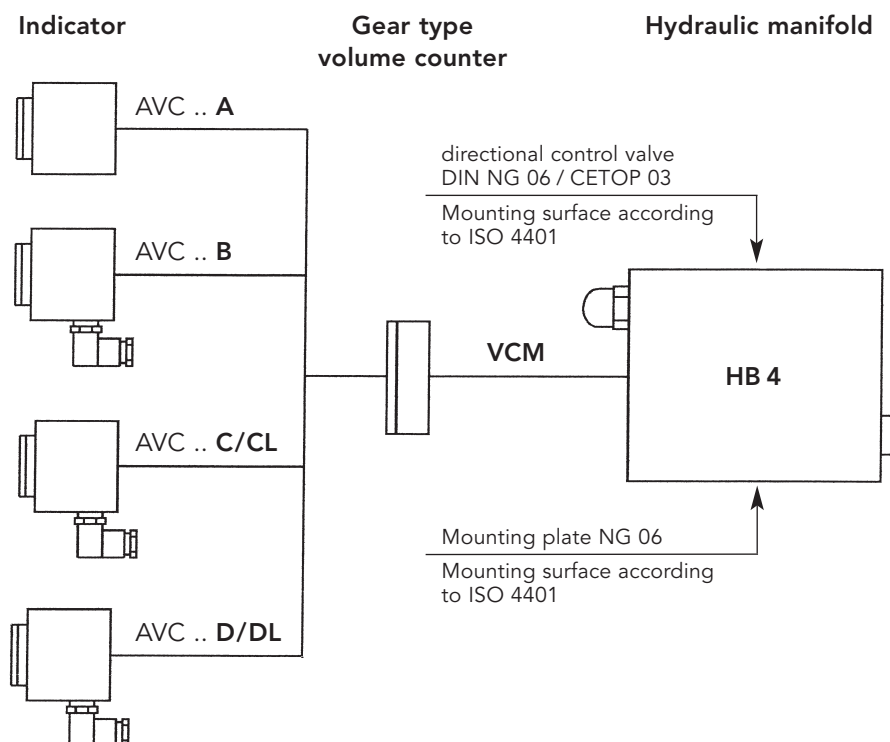
The Valve Position Indicator VOLUMEK is a combination unit with mounting surface for directional control valves NG 06 according to ISO 4401-03-02-0-02 / DIN 24340-A6.

In detail the module consists of a hydraulic manifold, a gear type volume counter and an indicator.

Mounted on a connection plate and completed by a directional control valve the VOLUMEK enables to control hydraulic operating ship armatures for ballast-, cargo- and stripping systems of all kind of tankers. In addition to that the adjusting path of the armature will be measured and displayed.

The Valve Position Indicator is suitable for the installation into deck boxes. The indication of the volumetric entered armature position can be read off optically locally or can be taken electrically by potentiometers or open / closed switches.

Modular design

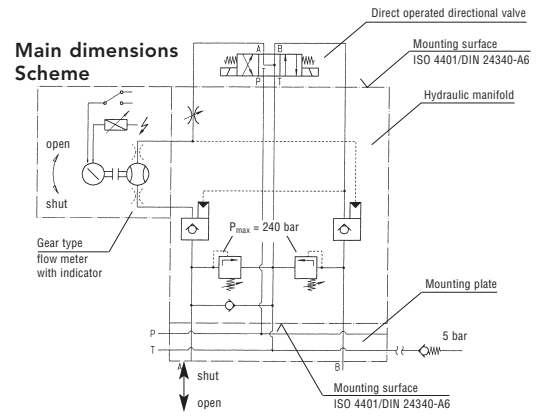
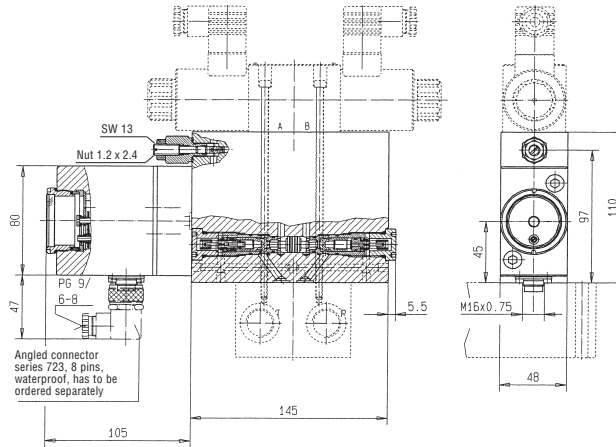


VOLUMEK Indicator

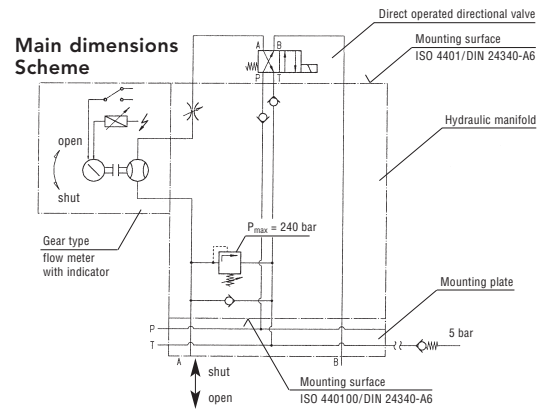
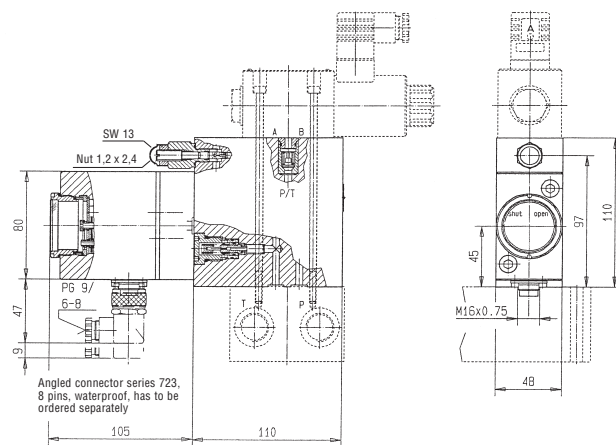
- AVC .. A Optically
- AVC .. B Open/close switches
- AVC .. C/CL Potentiometer
- AVC .. D/DL Open/close switches and potentiometer

Application examples

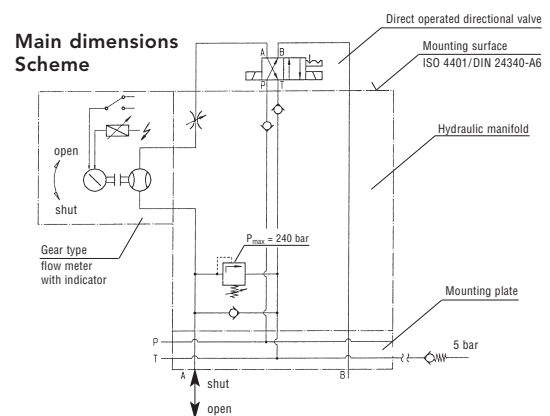
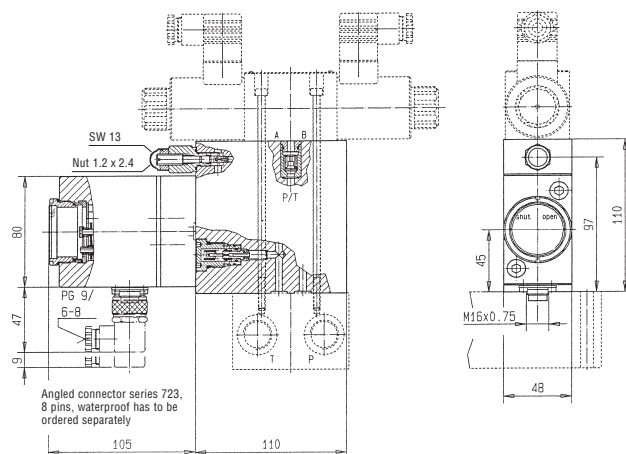
Application examples
for 4/3 directional valves spring centred (function 0311)



Application examples
for 4/2 directional valves spring return (function 0324)



Application examples
for 4/2 directional valves with detend (function 0324)



Function

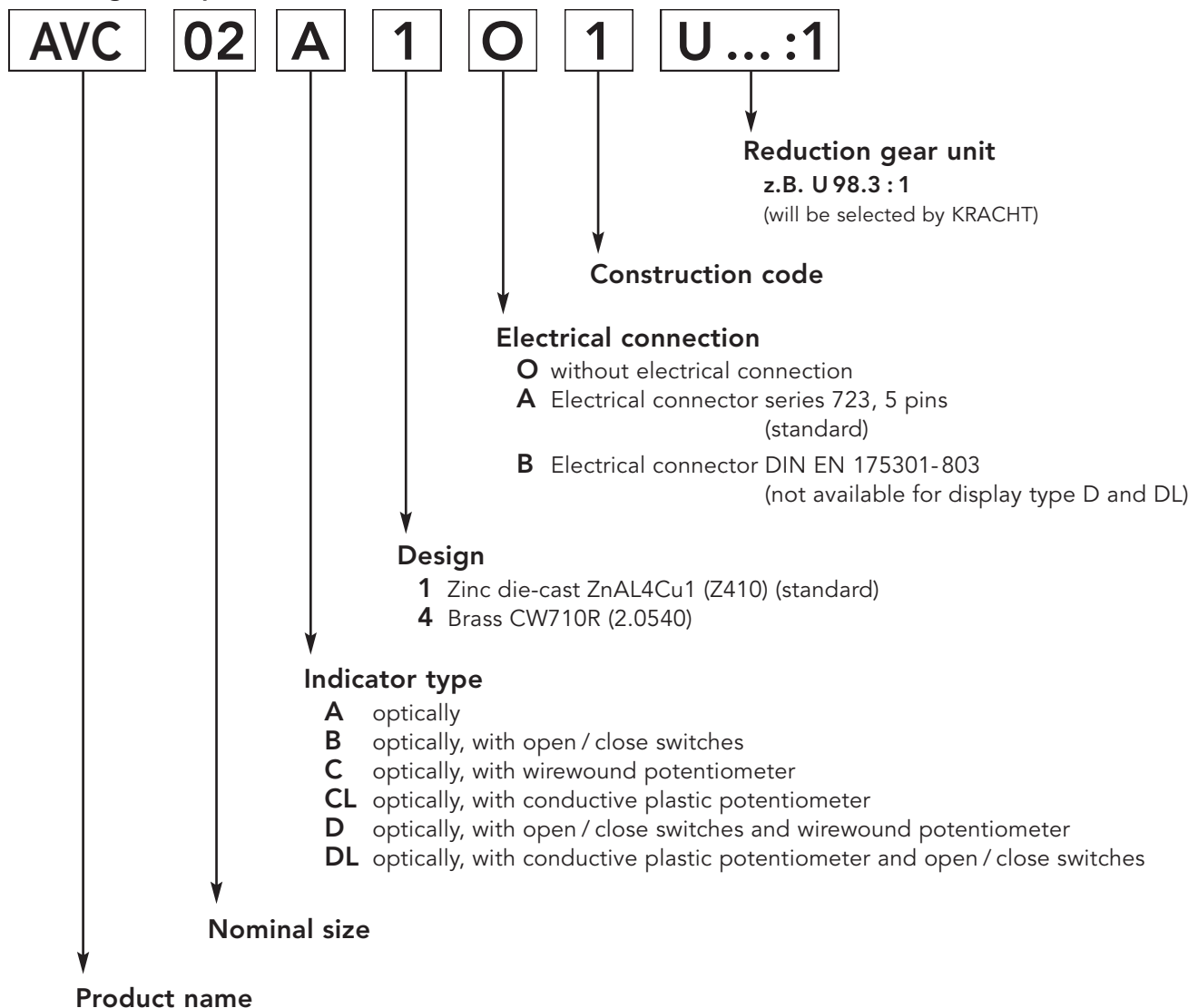
Together with the gear type volume counter the indicator builds the measuring unit. The turning of the gear wheels is transferred via a magnetic drive to the gear box of the indicator. For each application the turndown ratio of the gear box is configured to get a pointer movement of approx. 180°. The pointer is limited by two end stops. To reset the indication at each end position a slipping clutch is integrated.

The driving shaft of the magnetic drive is equipped with a small indication to recognize the movement of the gear wheels. It can be used as leakage detection.

The indicator is completely separated from the hydraulic circuit.

Type key – Indicator

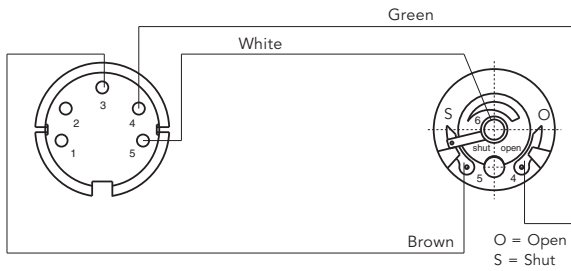
Ordering example



Electrical characteristics

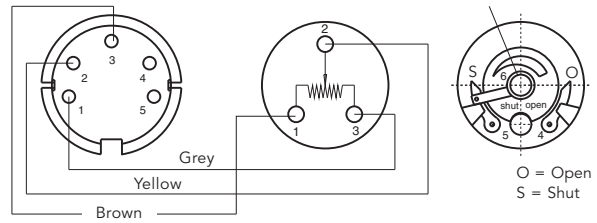
Electric installation – Indicator type B

Miniature round connector serie 723 Contact plate
 Contact arrangements, view to the solder-contacts



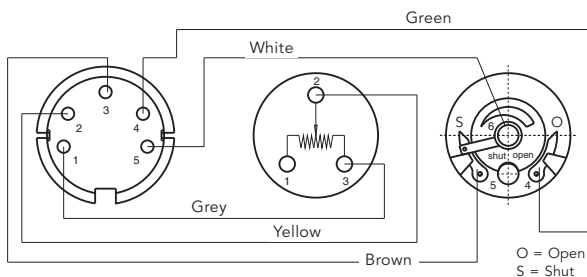
Electric installation – Indicator type C, CL

Miniature round connector Potentiometer Contact plate serie 723
 Contact arrangements, Open ca. 800 Ohm
 view to the solder-contacts Shut ca. 220 Ohm



Electric installation – Indicator type D, DL

Miniature round connector Potentiometer Contact plate serie 723
 Contact arrangements, Open ca. 800 Ohm
 view to the solder-contacts Shut ca. 220 Ohm

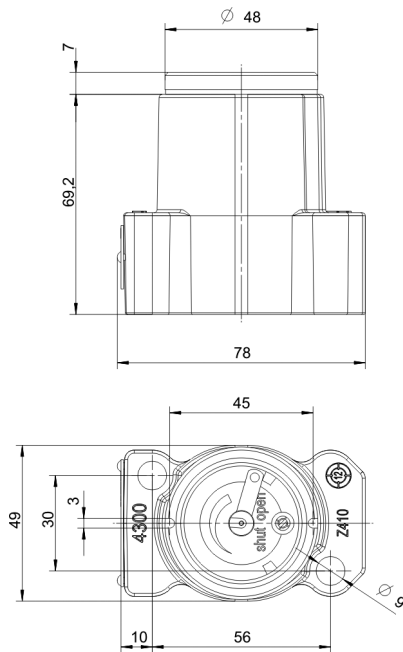


Technical data potentiometer

Electrical data	wirewound potentiometer (C, D)	conductive plastic potentiometer (CL, DL)
Nominal resistance R	1 K Ω	1 K Ω
Resistance tolerance	$\pm 10\%$	$\pm 20\%$
Linearity	$\pm 1.0\%$	$\pm 2\%$
Max. wiper current in case of malfunction	100 mA	1 mA
Power rating P	1 W/85 °C (195 °F)	0.2 W to 55 °C (131 °F)
Dielectric strength	900 VAC/1 min	500 V _{eff} /1 min
Insulating resistance	10 G Ω at 500 V DC	>1 G Ω at 500 V DC
Resistance resolution	0.37 %	
Ambience conditions		
Operating temperature	-55 °C ... +150 °C (-131 °F ... +302 °F)	-55 °C ... +105 °C (-131 °F ... +221 °F)
Climatic rating	55/150/56	
Degree of protection	IP 67	
Vibration	10 g (30...2000 Hz, 0,75 mm)	
Shock	50 g (half sine pulse, 7 ms)	

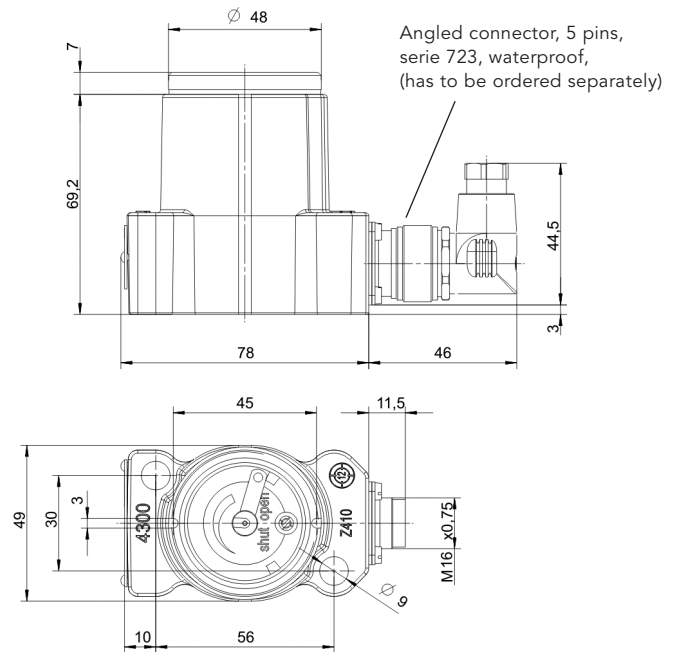
Dimensions AVC 02.1 (Standard)

Indicator without angled connector (Indicator type A)



Weight: 0,7 kg

Indicator with angled connected (Indicator type B, C, CL, D und DL)

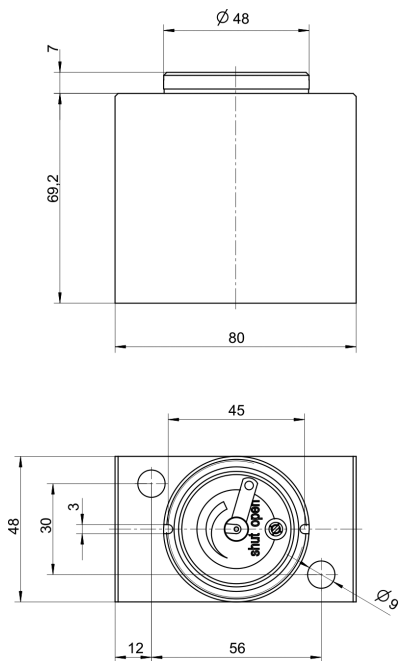


Angled connector, 5 pins, serie 723, waterproof, (has to be ordered separately)

Weight: 0,75 kg

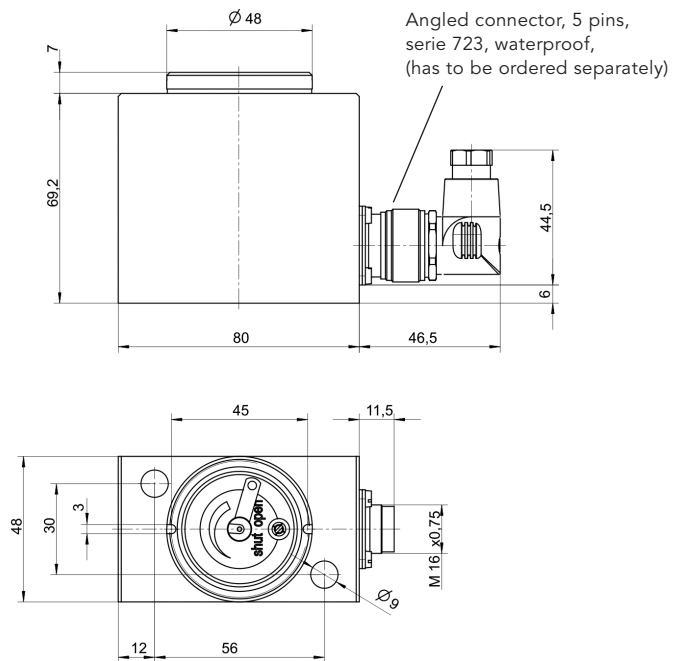
Dimensions AVC 02.4 (Brass)

Indicator without angled connector (Indicator type A)



Weight: 1,6 kg

Indicator with angled connected (Indicator type B, C, CL, D und DL)



Angled connector, 5 pins, serie 723, waterproof, (has to be ordered separately)

Weight: 1,65 kg

Function

The gear type flow meter can be used with all known hydraulic fluids, which have a minimum lubricity, are not aggressive concerning the used materials. The movement of the gears is transferred to the indicator by a permanent-magnetic coupling.

There is no connection between the indicator and the hydraulic circuit. The volume counter with connected indicator is suitable for installation in deck-boxes.

General characteristics

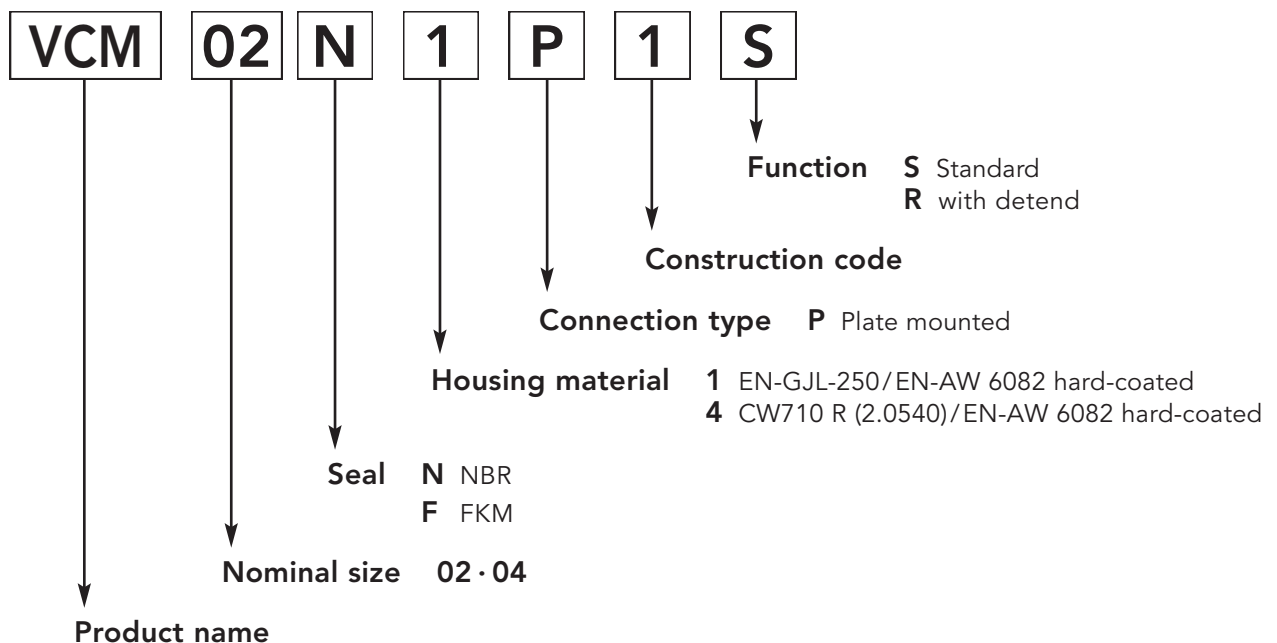
Connection	Plate mounted
Weight	VCM 02.1... : 0,75 kg
	VCM 02.4... : 0,80 kg
	VCM 04.1... : 1,05 kg
	VCM 04.4... : 1,15 kg
Mounting position	optional
Dimensions	see page 8
Ambient temperature	$\vartheta_{m \min} = -20\text{ °C} (-4\text{ °F})$ $\vartheta_{m \max} = +60\text{ °C} (+140\text{ °F})$
Liquid temperature	$\vartheta_{m \min} = -20\text{ °C} (-4\text{ °F})$ $\vartheta_{m \max} = +80\text{ °C} (+176\text{ °F})$

Hydraulic characteristics

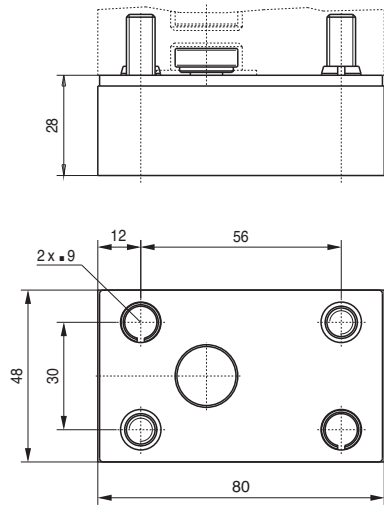
Max. pressure	p_{\max}	= 200 bar
Max. pressure peak	p	= 240 bar
Max. flow rate	VCM 02 Q	= 4 l/min
	VCM 04 Q	= 7 l/min
Viscosity	v_{\min}	= 20 mm/s
	v_{\max}	= 380 mm/s (higher viscosities on request)
Fluids	Mineral oil acc. to DIN 51524/25 other fluids on request	

Type key – Volume counter

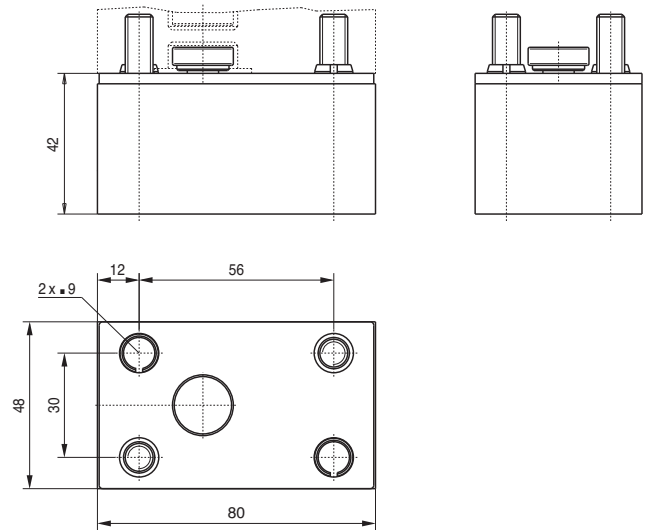
Ordering example



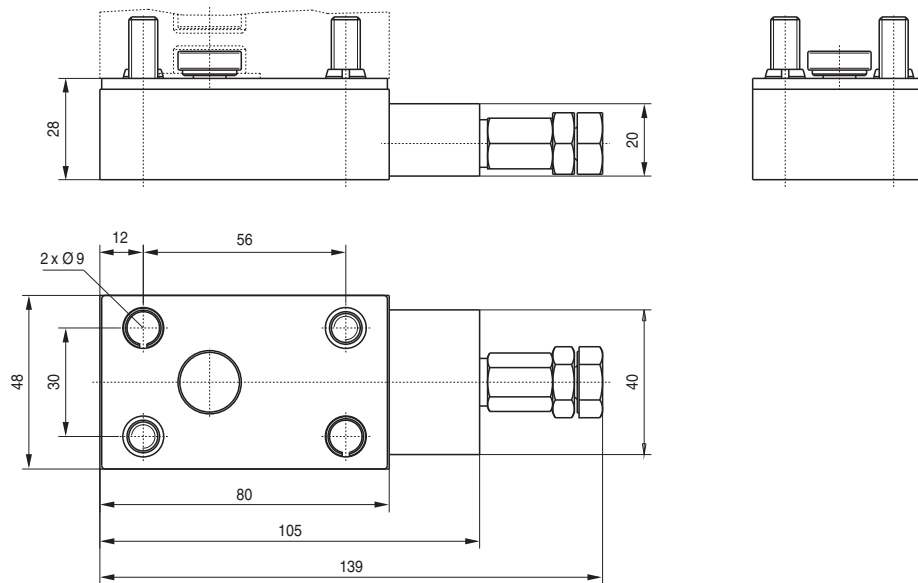
Dimensions VCM 02... S (Standard)



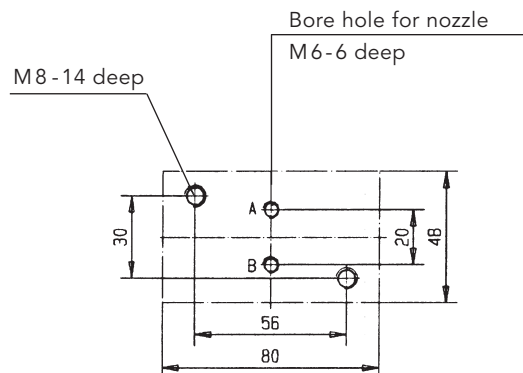
Dimensions VCM 04... S (Standard)



Dimensions VCM 02... R (with detend)



Mounting surface VCM 02/04



Function 0311

- double pilot operated check valve for holding the actuator position
- two pressure relief valves for limiting the pressure caused by increased temperature
- throttle valve in port A for speed regulation of the actuator
- check valve for filling the piping to avoid wrong indications when temperature fluctuates

Function 0324

- check valve in P for holding the actuator position when switching parallel actuators
- check valve in T to avoid indicator fluctuations due to pressure pulsation
- one temperature pressure relief valve for limiting the pressure caused by increased temperature
- throttle valve in port A for speed regulation of the actuator
- check valve for filling the piping to avoid wrong indications when temperature fluctuates

General characteristics

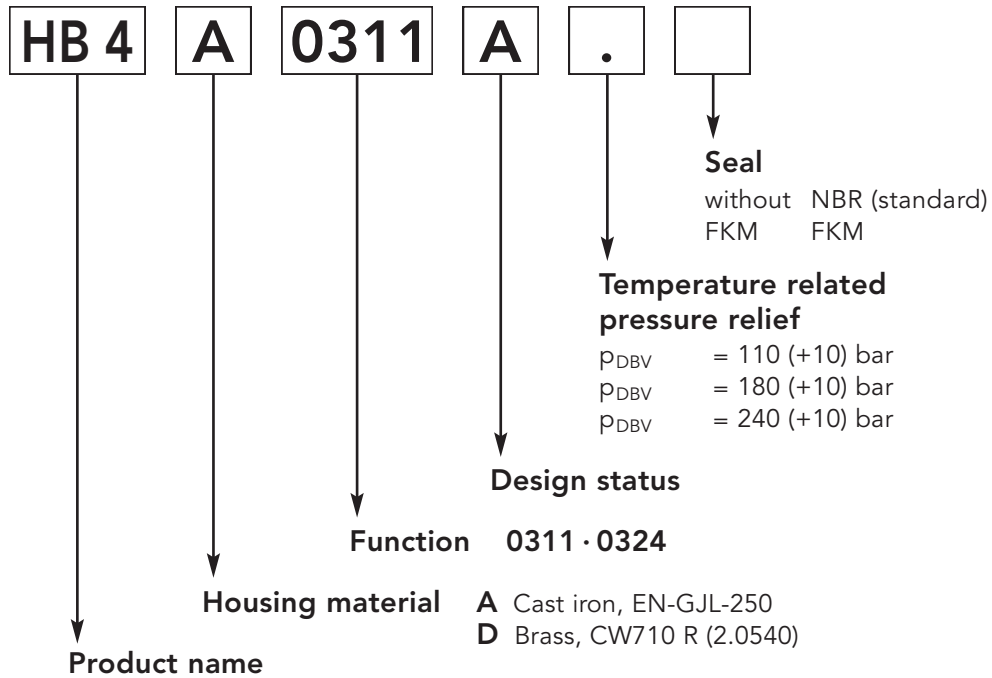
Mounting surface	ISO 4401 / DIN 24340-A6
Nominal size	06
Design	Sandwich-seatvalve
Type of fixation	Plate mounted
Type of connection	Mounting plate
Dimensions	see page 10
Mounting position	optional
Flow direction	see schema page 9
Ambient temperature	$\vartheta_{\min} = -20\text{ °C} (-4\text{ °F})$ $\vartheta_{\max} = +60\text{ °C} (+140\text{ °F})$
Liquid temperature	$\vartheta_{m\ min} = -20\text{ °C} (-4\text{ °F})$ $\vartheta_{m\ max} = +80\text{ °C} (+176\text{ °F})$
Weight	HB 4 A 0311.. 5,2 kg HB 4 D 0311.. 6,2 kg HB 4 A 0324.. 3,9 kg HB 4 D 0324.. 4,7 kg

Hydraulic characteristics

Operating pressure	$p_{\max} = 200\text{ bar}$
Pressure relief valve	$p_{\max\ DBV} = 240\text{ bar}$
Flow rate	6 l/min (10 l/min)
Viscosity	$v_{\min} = 20\text{ mm}^2/\text{s}$ $v_{\max} = 380\text{ mm}^2/\text{s}$
Fluids	Mineral oil acc. to DIN 51524/25 other fluids on request

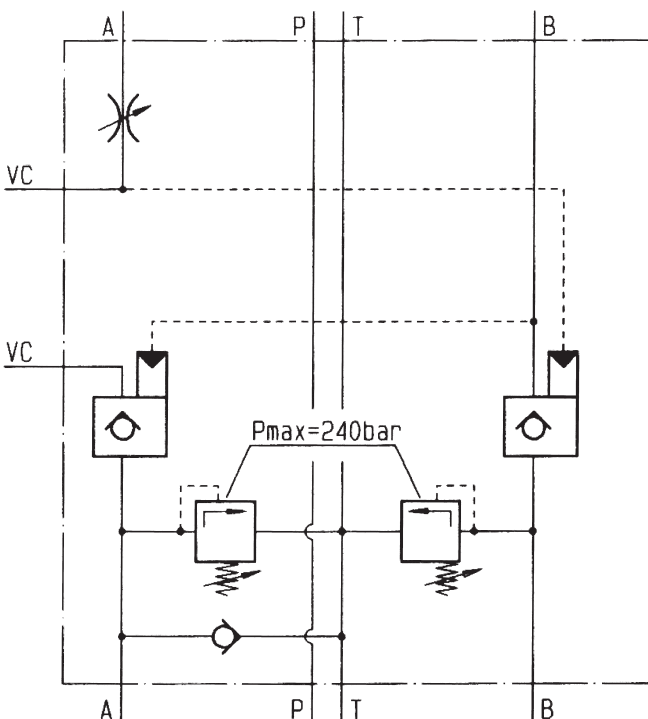
Type key – Hydraulic manifold

Ordering example

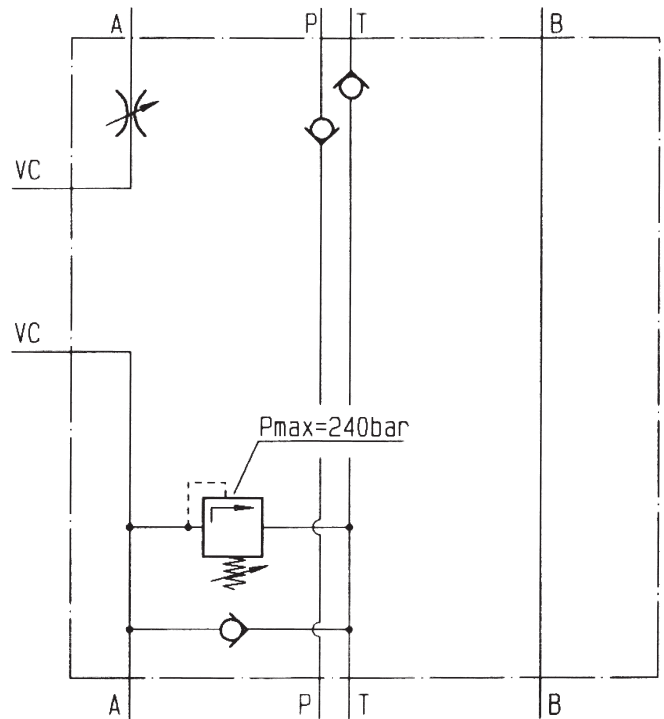


Function

Scheme 0311

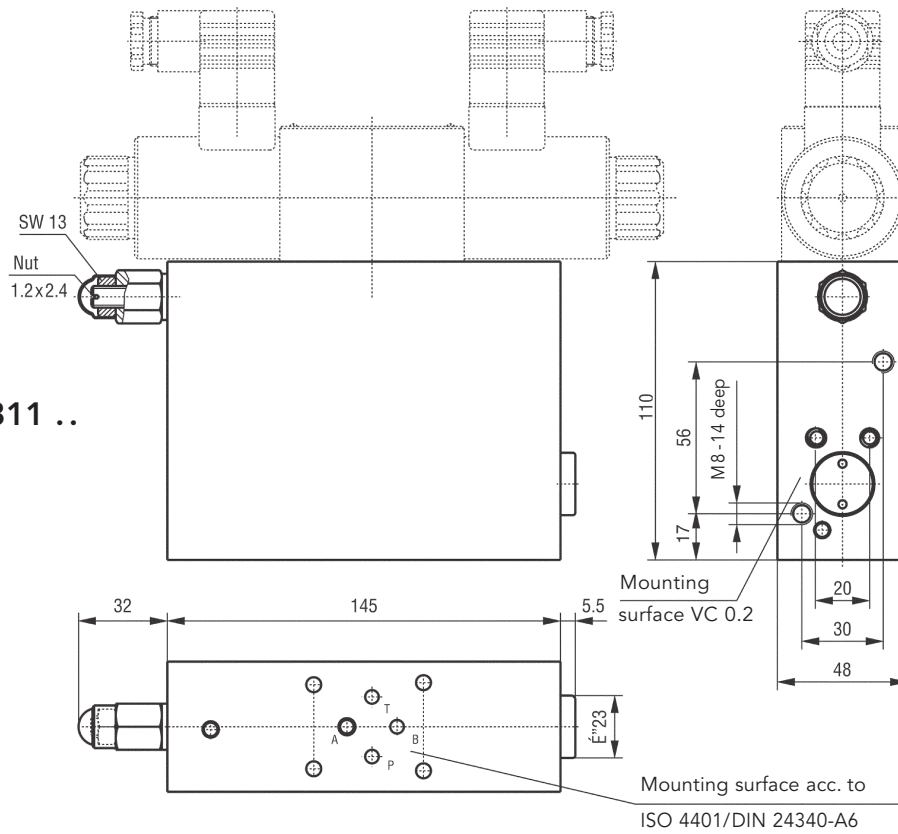


Scheme 0324

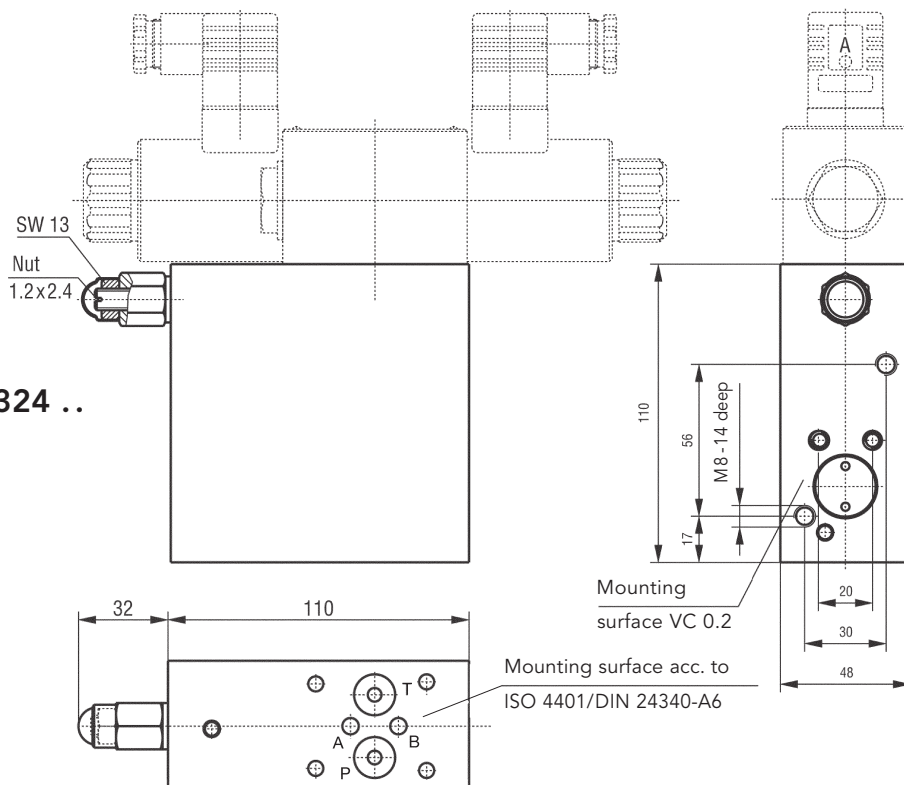


Dimensions

HB 4 . 0311 ..



HB 4 . 0324 ..



Product Portfolio

Transfer Pumps

Transfer pumps for lubricating oil supply equipment, low pressure filling and feed systems, dosing and mixing systems.

Mobile Hydraulics

Single and multistage high pressure gear pumps, hydraulic motors and valves for construction machinery, vehicle-mounted machines.

Flow Measurement

Gear and turbine flow meters and electronics for volume and flow metering technology in hydraulics, processing and laquering technology.

Industrial Hydraulics / Test Bench Construction

Cetop directional control and proportional valves, hydraulic cylinders, pressure, quantity and stop valves for pipe and slab construction, hydraulic accessories for industrial hydraulics (mobile and stationary use).

Technology Test benches / Fluid Test benches.



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