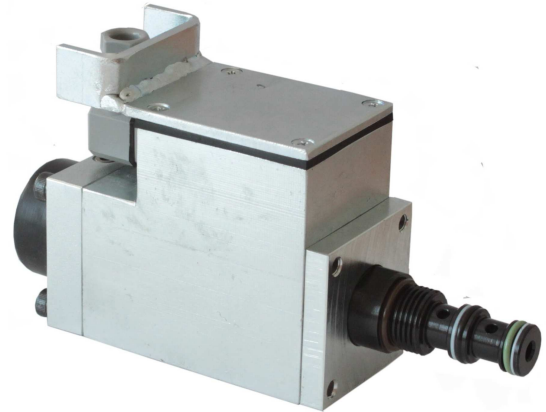


DATA SHEET - OPERATION MANUAL

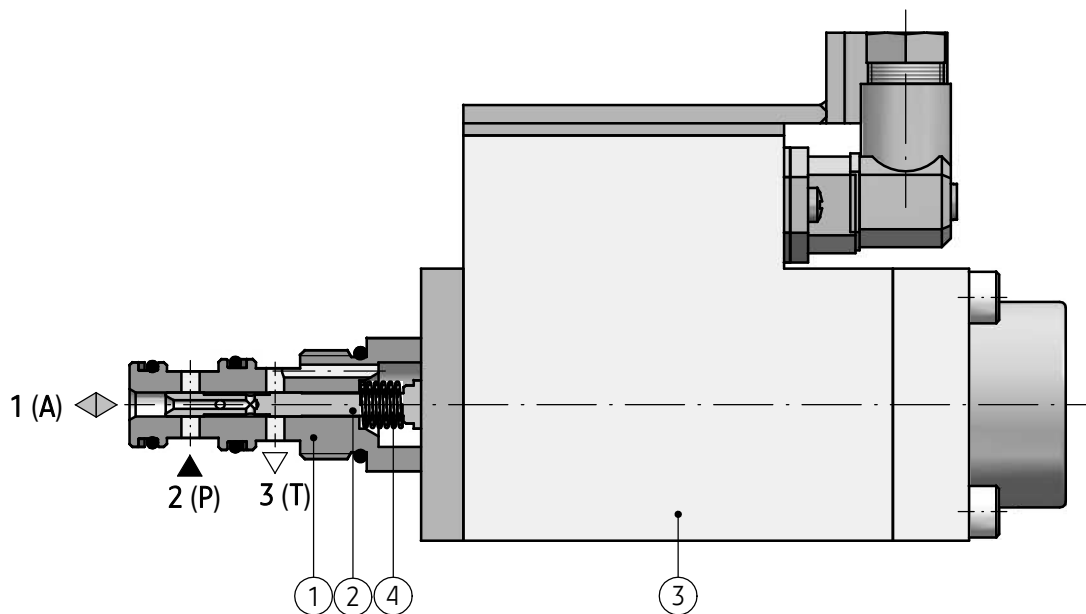
APPLICATION

Intrinsically safe pressure reducing - relief cartridge valve type **IWZCDE4** ... is used for maintaining a given value of pressure which is set continuously, electrically in a hydraulic system. The value of the reduced pressure is a function of the current in the electromagnet coil. This valve can be used in control systems of pumps, hydraulic couplings, brakes and as an initial valve for controlling proportional directional valves (for example, in sectional mobile directional valves). The valve allows to control pressure in the port **A**, at a pressure increase from the supply side **P**, and an increase from the receiver side **A**. It is intended for operation in explosive atmospheres of underground mining pits. It can work with an intrinsically safe output circuit "ia" or "ib" of max. parameters: $U_i = 15 \text{ V}$, $I_i = 2 \text{ A}$, $C_i = 0$, $L_i = 0$.



DESCRIPTION OF OPERATION

IWZCDE4 - 12/18 - 12 N



The proportional, intrinsically safe pressure reducing - relief valve type **IWZCDE4**... is a 3-way valve directly controlled with a proportional solenoid (3). The main components of the valve are: sleeve (1), spool (2), proportional solenoid (3) and spring (4). When in a not-

actuated valve position (zero solenoid current), port **A** is connected with the tank through the channel **T**, channel **P** remains cut off. When in this position, the reduced pressure in port **A** has zero value.

DESCRIPTION OF OPERATION


At the increase of the controlling current, the solenoid force (3), overcoming the initial spring tension (4) moves the spool (2) inside the sleeve (1), gradually reducing the flow section at the way from A - T and simultaneously opening the flow way P - A. This results in a pressure increase at the port A. With an increase of the reducing pressure value in the port A, there follows an increase of the produced force, which supports the solenoid force (3) in overcoming influencing the spool (2) hydrodynamic

forces, until a state of equilibrium is established. In this way, for each solenoid current value (3) a state of equilibrium at different values of forces is achieved, which causes that the reduced pressure value at the port A is precisely specified by the controlling current value as shown on the sheet 7. In case of a pressure increase at the port A set above, the A - T way opens and the valve acts as relief one.

TECHNICAL DATA

Hydraulic fluid	mineral oil	
Required filtration	up to 16 μm	
Recommended filtration	up to 10 μm	
Nominal fluid viscosity	37 mm^2/s at temperature 55°C	
Viscosity range	2,8 up to 380 mm^2/s	
Fluid temperature range (in tank)	recommended	40°C do 55°C
	max	-20°C do +70°C
Ambient temperature range T_a	- 20°C do +60°C	
Maximum pressure in the port P	21 MPa	
Maximum set pressure in port A	1,8 MPa	
Flow rate	3 dm^3/min	
Coil resistance at temperature 20°C (without semiconductors)	20,2 Ω	
Control type	signal PWM 150 Hz	
Hysteresis	< 7%	
Maximum solenoid current	0,3 A	
Degree of protection	IP 65	
Weight	1,5 kg	

COMPLIANCE WITH THE DIRECTIVE 94/9/WE

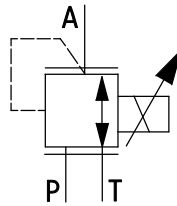
Quality assurance certificate	CE 1026 FTZU	No. : FTZ U 05 ATEX Q 013
Certificate of examination type	KOMAG 14ATEX0057X	
Intrinsic safety feature	 I M 1 Ex ia I Ma	

ASSEMBLY AND OPERATION REQUIREMENTS

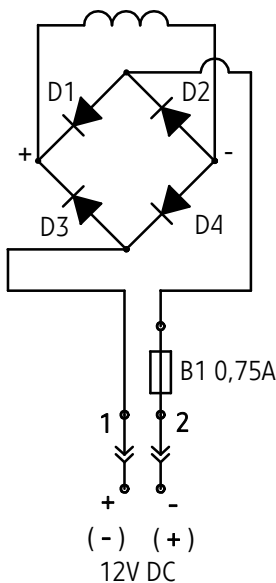
1. The electric connection of the valve must be made according to the circuit diagram shown below!
2. Conductors of the valve must meet the requirements applicable for mining equipment.
3. Only qualified employees are allowed to connect /disconnect the valve to/from electrical system.
4. During the operation one must maintain the recommended fluid viscosity and provide proper filtration specified in this data sheet-operation manual.
5. In order to ensure safe and failure-free operation of the valve, the following must be checked:
 - condition of the electric connection
 - operation of the valve
 - cleanliness of the hydraulic fluid
6. The electromagnet plug shall precisely adhere to the socket and shall be secured by screwing securely the thread bolt until it stops. One must ensure the tightness and proper cable clamp in the plug gland.
7. In order to provide proper tightness of the valve connection to a hydraulic system, the tightening torque shall be $35 \div 40 \text{ Nm}$. One should ensure proper dimensions of the connection socket, sealing rings and valve operation parameters as specified in this Data Sheet – Operation Manual.
8. It is forbidden to provide any repairs underground, in mining conditions. A damaged valve must be supplied to the producer for repair. Address of the technical service is shown on the last page of this Data Sheet – Operation Manual.
9. A person operating the valve must be familiarized with the content of this Data Sheet – Operation Manual.

SCHEMES

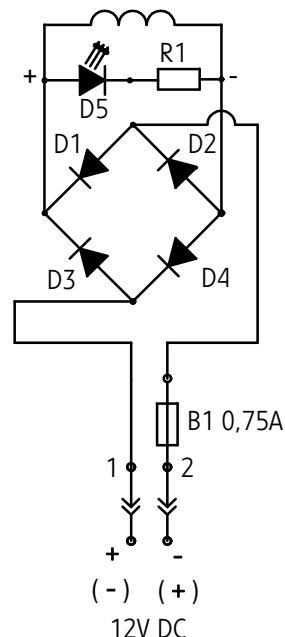
Graphical symbol of the valve type IWZCDE4...



Electrical circuit diagrams of valve type IWZCDE4...



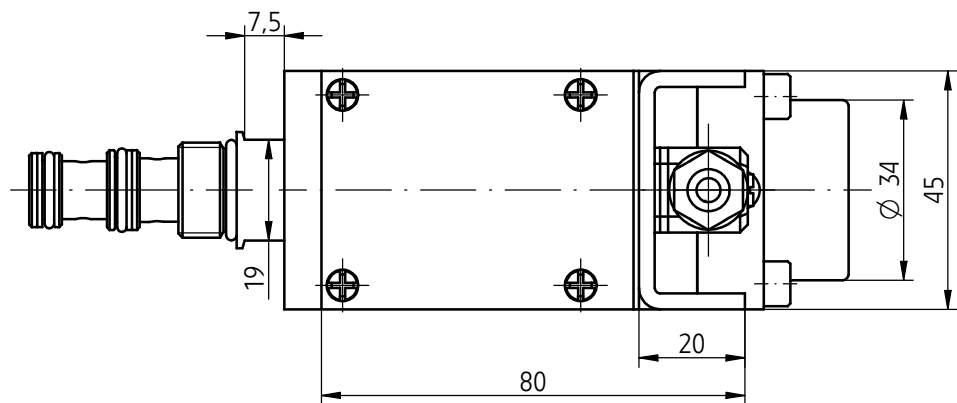
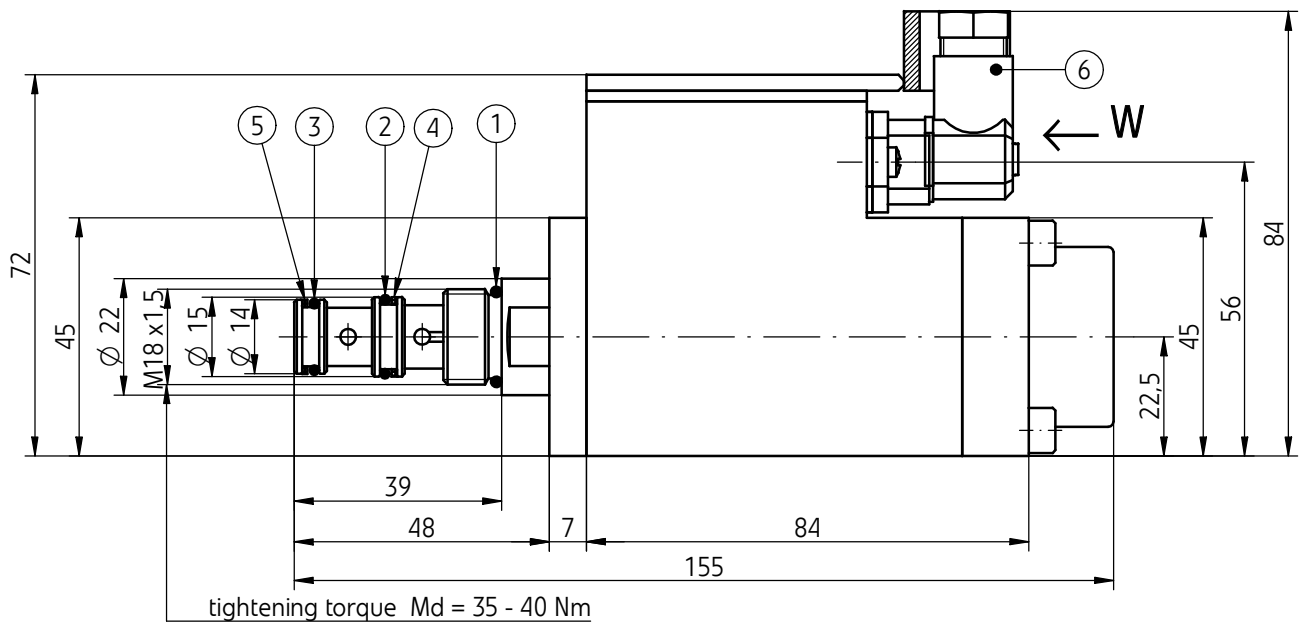
version without a LED light signaling
IWZCDE4 ...N...



version with a LED light signaling
IWZCDE4 ...NL

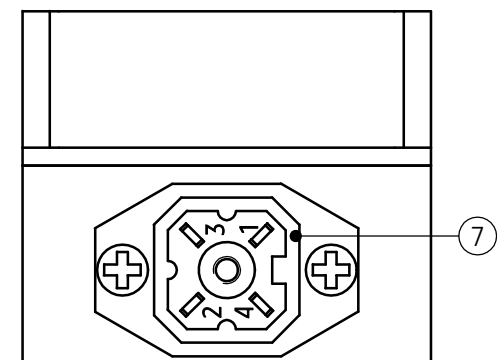
OVERALL AND CONNECTION DIMENSIONS

valve type IWZCDE4



view W

without plug - pos. 6



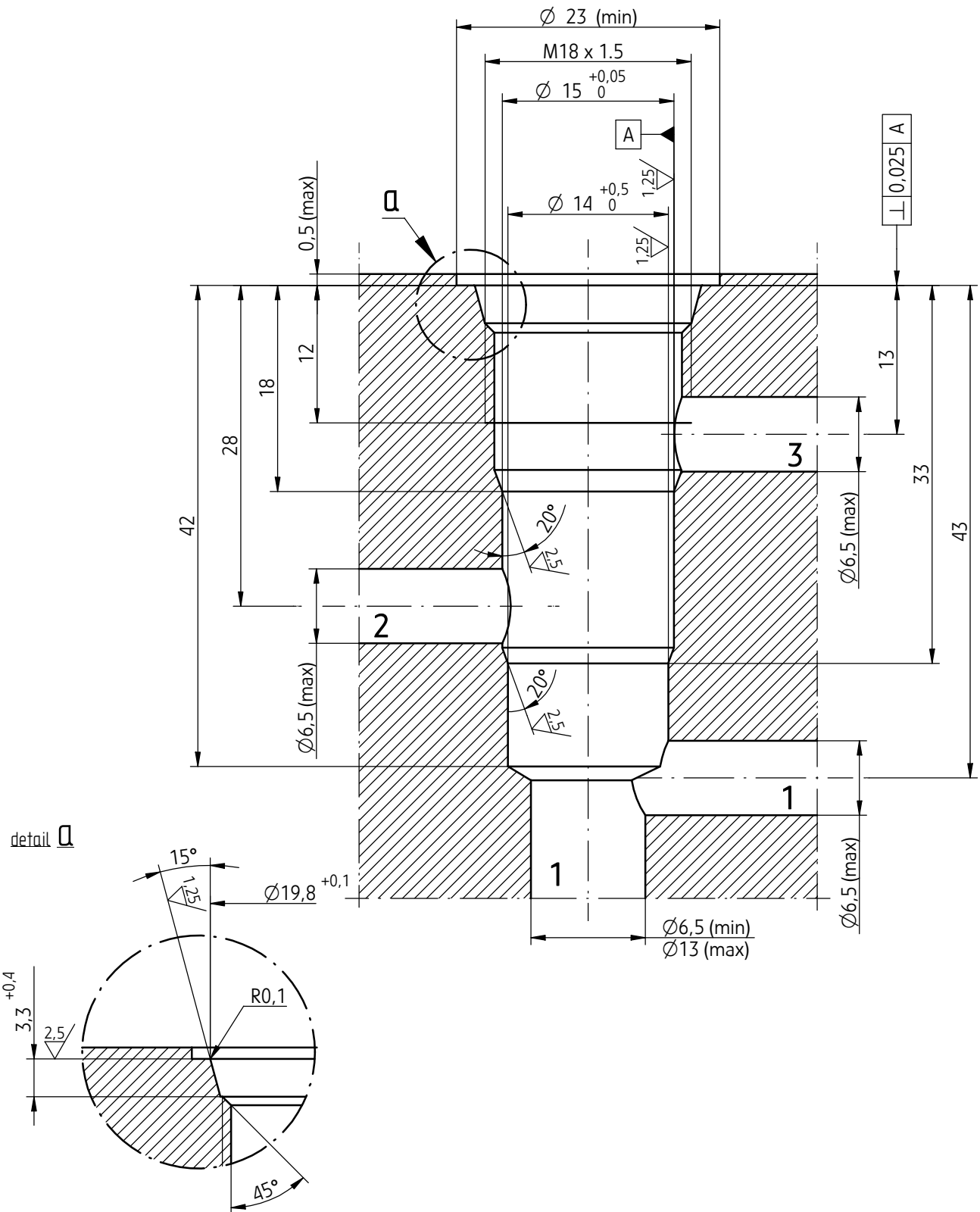
1 - O-ring 16 x 2	- pcs. 1
2 - O-ring 11 x 2	- pcs. 1
3 - O-ring 10,82 x 1,78	- pcs. 1
4 - Ring PTFE 12,2 x 15 x 1	- pcs. 1
5 - Ring PEP 11 x 14 x 0,6	- pcs. 1
6 - Plug type Hirschmann G4 KW 1F	
7 - Valve electrical connection	

OVERALL AND CONNECTION DIMENSIONS

connecting port M-04-3 (M18 x 1,5 - 3 way)

tightening torque $Md = 35 - 40 \text{ Nm}$

$\textcircled{\phi} 0,025$ - refers to all diameters of the main hole and chamfers



HOW TO ORDER

IWZCDE	4	+	/	18	-	12	N					*
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Nominal size (NS) NS4 = 4												
Series number (02 - 09) - connection and installation dimensions unchanged = 0X series 02 = 02												
Settable pressure range 1,8 MPa = 18												
Type of solenoid solenoid supply voltage U = 12V DC; current I_{max} = 0,3 A = 12												
Manual control of solenoid solenoid with manual override button = N												
Type of electric connection of solenoid plug type Hirschmann G4KW 1F = no designation												
Indicator of solenoid begin turned on without signaler LED = no designation with signaler LED = L												
Sealing NBR (for liquids on mineral oil base) = no designation FKM (for liquids on phosphate base) = V												
Any other additional requirements specified in clear text (to be agreed with manufacturer)												

NOTES:

The valve should be ordered according to the above coding.

The symbol in bold are the preferred versions available in short delivery time.

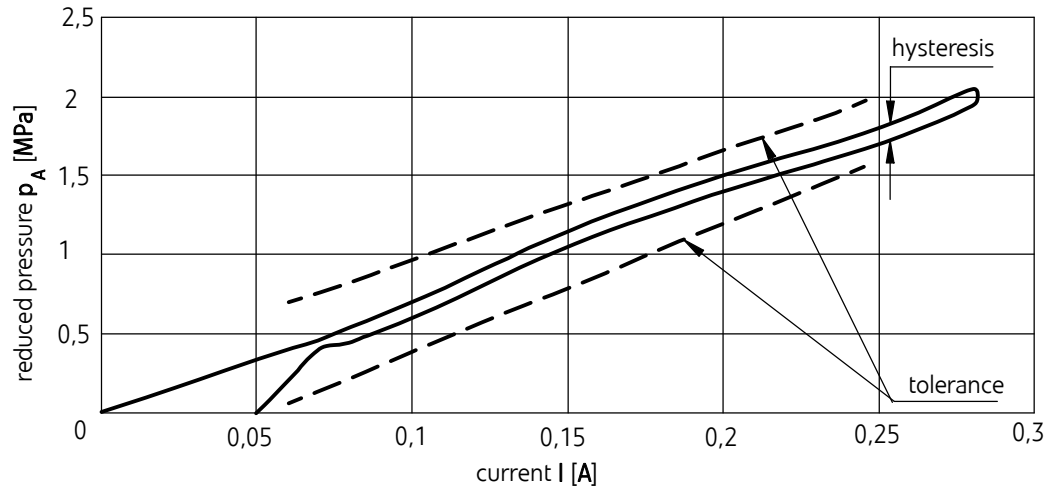
Coding example: IWZCDE4 - 02/18 - 12 N

CHARACTERISTICS

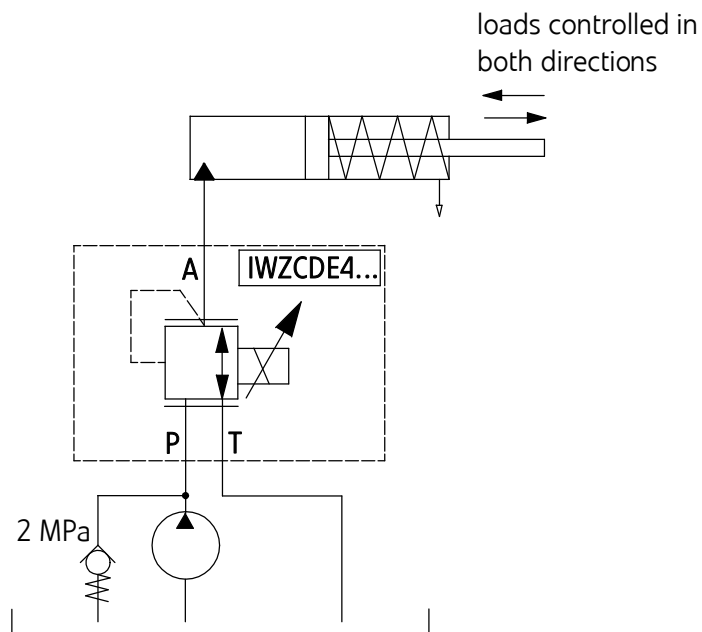
for oil viscosity $\nu = 41 \text{ mm}^2/\text{s}$ at temperature $t = 50^\circ\text{C}$

Characteristic of current $p_A(I)$

Characteristic $p_A(I)$ - pressure in port A in relation to current I controlling of solenoid coil



EXAMPLE OF APPLICATION IN HYDRAULIC SYSTEM



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