

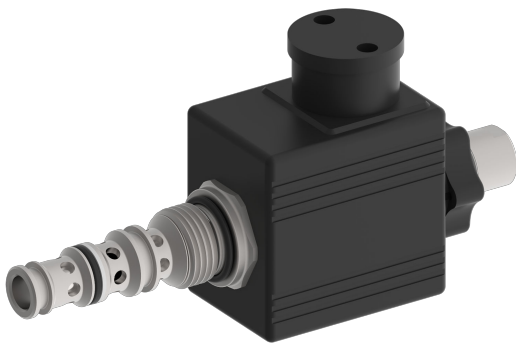
Flow valve

Throttle valve

$Q_{\max} = 15 \text{ gpm}$, $p_{\max} = 3600 \text{ psi}$

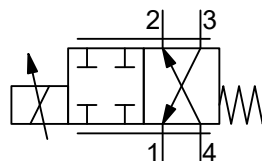
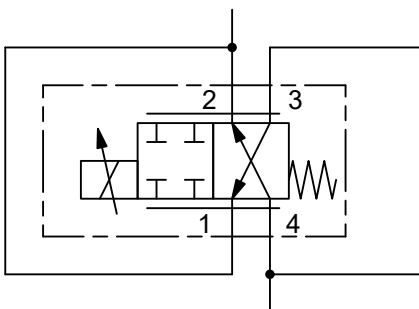
Direct acting, spool type, proportional solenoid

Type series: MDT42ANK2NY-5...



- Screw-in cartridge valve for cavity AN
- All external parts with zinc-nickel plating according to DIN EN ISO 19598
- Dual flow paths for higher flow rate
- For use with inline or bypass pressure-compensator cartridges
- Optional with emergency manual flow setting
- Reliable operation over the whole pressure and flow range (even with high pressure differentials)
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available

Symbol



Description

The direct acting, 4/2 proportional throttle valve is a high-performance threaded screw-in cartridge valve in size 05 with dual flow paths. The valve is designed on the sliding-spool principle. The dual flow paths allow a higher flow rate with low headloss. This requires connecting port 3 to port 4 and port 1 to port 2 in the valve housing (cavity in manifold block. See "Dual flow

paths"). When de-energized, the connections from 3 to 1 and from 4 to 2 are open. When energized, the flow rate from 3 to 1 and from 4 to 2 can be throttled or disabled in proportion to the required value (current). The valve is used with an inline compensator or a bypass hydrostat, predominantly in mobile and industrial applications for precise proportional control of flow rates.

The valve is available with an optional push-button override with a pin (Type "P") or with a screw-type emergency override (Type "S") including an integrated emer-

gency manual flow setting. The slip-on coil can be replaced without opening the hydraulic circuit and can be positioned at any angle through 360°.

Technical data

General characteristics	Description, value, unit
Function group	flow valve
Function	throttle valve
Design	screw-in cartridge valve
Controls	proportional solenoid
Characteristic	direct acting, spool type
MTTFd value	150 years
Construction size	NG 05
Thread size	3/4-16 UNF-2A
Mounting attitude	unrestricted (preferably vertical, coil down)
Weight	1.21 lb
Cavity acc. factory standard	AN
Tightening torque steel	30 ft·lb
Tightening torque aluminium	30 ft·lb
Tightening torque tolerance	± 10 %
Minimum ambient temperature	- 13 °F
Maximum ambient temperature	+ 140 °F
Surface protection	all external parts with zinc-nickel plating according to DIN EN ISO 19598
Seal kit order number	NBR: DS-248-N / FKM: DS-248-V

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	3600 psi
Maximum flow rate	15 gpm
Nominal flow rate	Δp 145 psi: 12 gpm gpm
Flow direction	see symbol
Hydraulic fluid	HL and HLP mineral oil according to DIN 51 524; other fluids on request!
Minimum fluid temperature	- 22 °F
Maximum fluid temperature	+ 158 °F
Viscosity range	15 ... 380 mm ² /s (cSt)
Recommended viscosity range	20 ... 130 mm ² /s (cSt)
Minimum fluid cleanliness (cleanliness class according to ISO 4406:1999)	class 18/16/13
Internal leakage flow rate	< 2.1 in ³ /rev (with pN 3600 psi) with oil viscosity 33 mm ² /s (cSt)

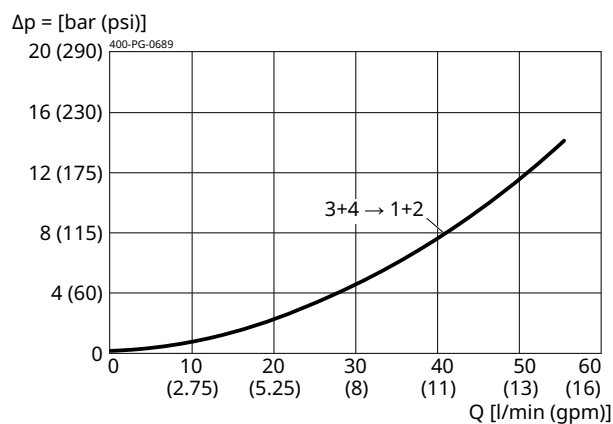
Electric characteristics

Electric characteristics	Description, value, unit
Actuator type	solenoid coil
Solenoid coils type	36X48/16.1
Supply voltage DC	12 V DC 24 V DC
Control current	12 V = 0...1600 mA 24 V = 0...800 mA
Nominal power consumption	30 W
Relative duty cycle	100 %
Recommended PWM frequency	150 Hz
Response sensitivity with PWM	< 2 % I_{max}
Reproducibility with PWM	< 3 % Q_{nenn}
Hysteresis with PWM	2...5 % I_{max}
Reversal error with PWM	2...5 % I_{max}
Electrical connection coil	several connection types available, see ordering code
Protection class solenoid coil to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see Ordering code (with appropriate mating connector and proper fitting and sealing)

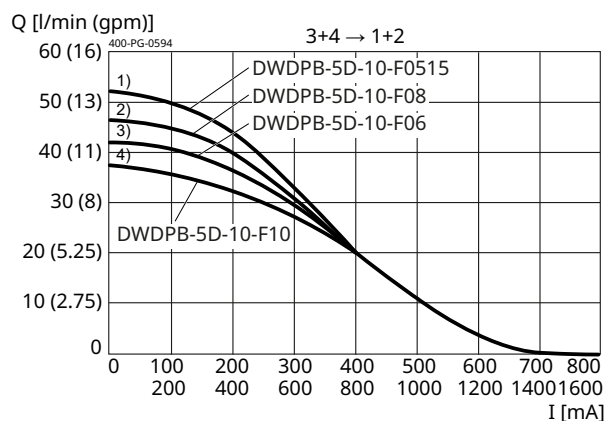
Performance graphs

measured with oil viscosity 33.0 mm²/s (cSt)

$\Delta p = f(Q)$ Pressure drop-flow rate characteristic

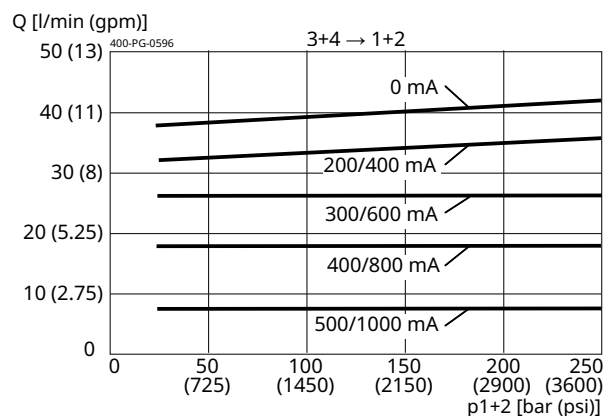


$Q = f(I; \Delta p)$ Flow rate adjustment



$Q = f(p_1)$ Flow rate load-pressure

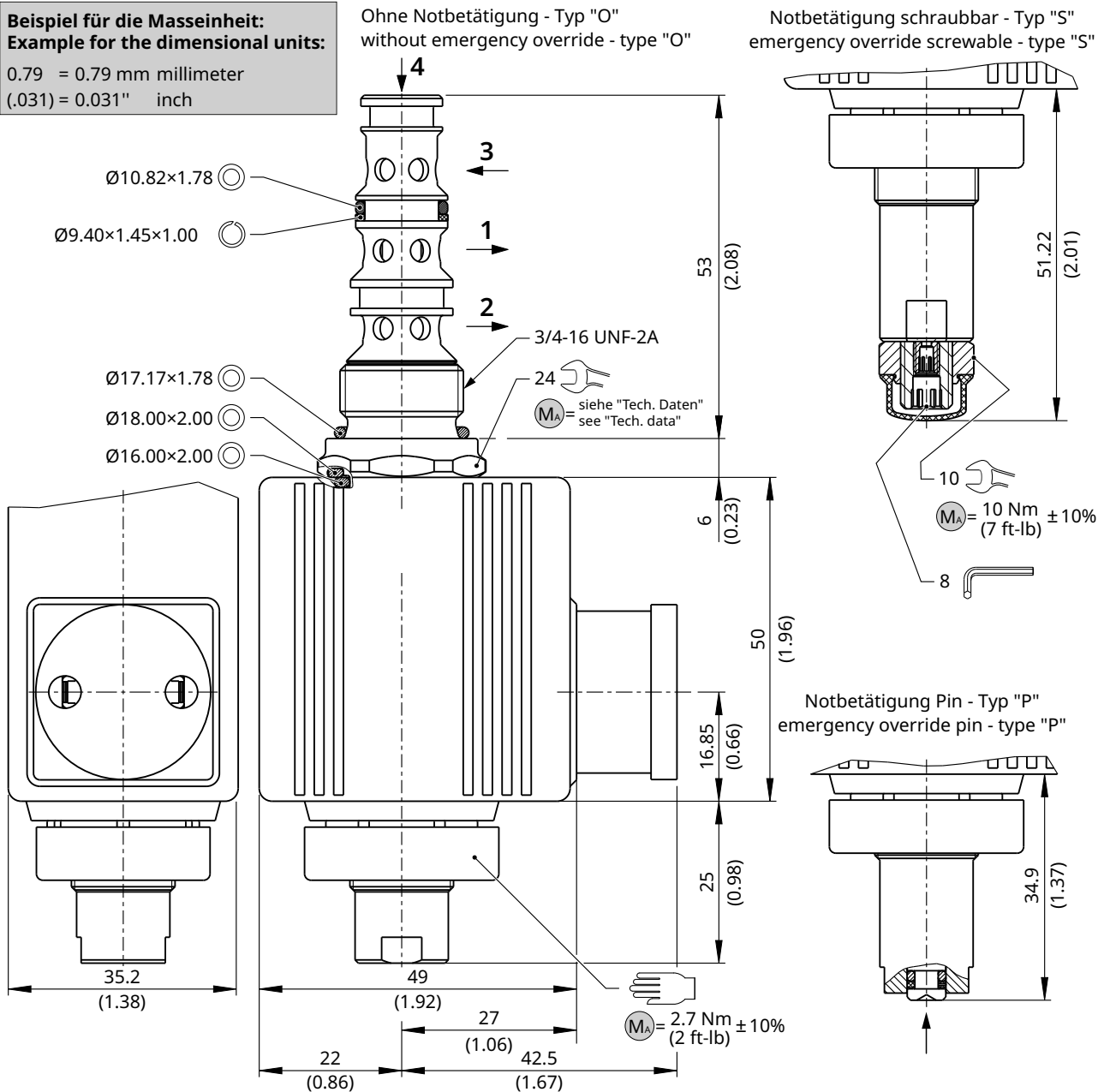
Meas. with pressure compensator DWDPB-5D-10-F08



Installation

**Beispiel für die Masseinheit:
Example for the dimensional units:**

0.79 = 0.79 mm millimeter
(.031) = 0.031" inch



NOTE!

- Observe tightening torques (M_A).
- Mount the valve preferably suspended (automatic air bleed).
- The valve is factory-set, no further adjustments are necessary.



IMPORTANT!

- Prerequisite to achieve the valve's maximum performance rating:
- the solenoid is mounted aligned as depicted.
 - mounted in a steel body.



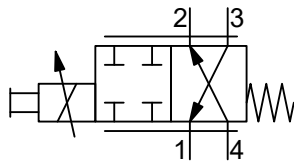
ATTENTION!

Only qualified personnel with mechanical skills may carry out the following work:

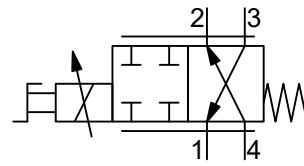
- installation and, if necessary, adjustment.
- replacement of slip-on solenoid coil, if present (solenoid coil type; see "Technical Data").
- inspection and, if necessary, replacement of the seals shown in the illustration. New seals must only be installed after being oiled or greased (seal kit; see "Technical Data").

Additional symbols

MDT42ANK2NY-5P-...

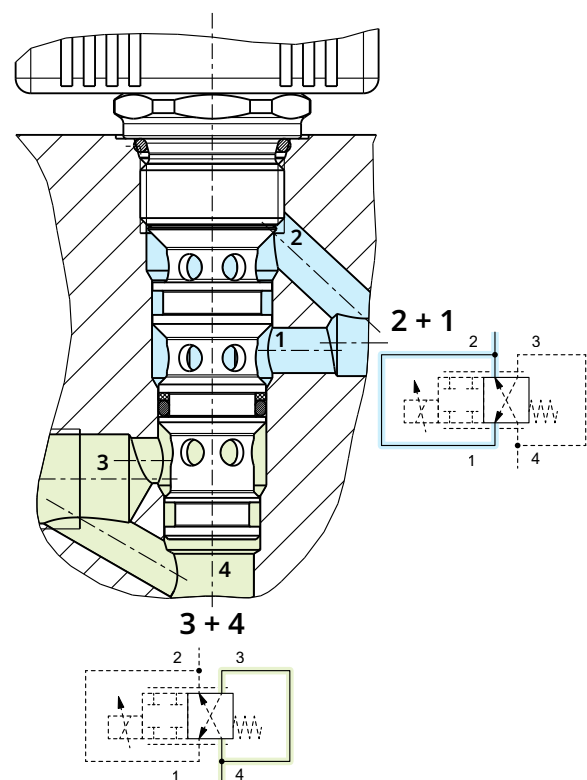


MDT42ANK2NY-5S-...



Dual flow-path

The dual flow paths allow a higher flow rate with low headloss. This requires connecting port 3 to port 4 and port 1 to port 2, in the manifold block in cavity AN.



Air-bleeding

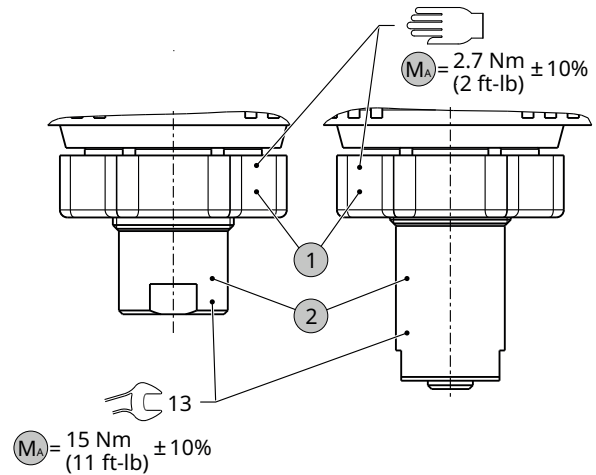
Bleed air from types "O" and "P":

1. Remove the knurled nut ①.
2. Loosen the cap nut ② approx. 1.5 turns.

NOTE

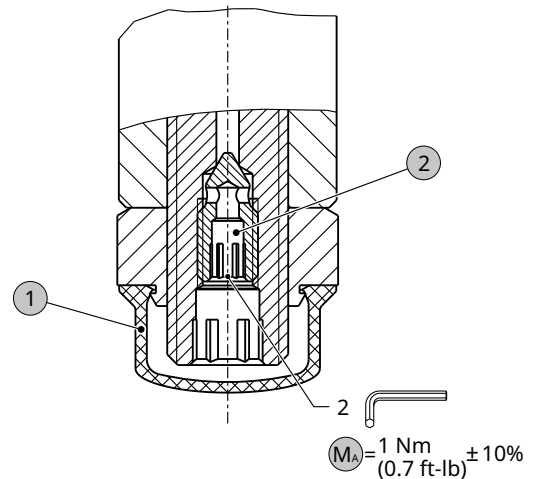
Loosening the cap nut ② allows oil to spray out.

3. Operate the valve until no more air bubbles escape.
4. Tighten the cap nut ② (observe tightening torques M_A).
5. Remount the knurled nut ①.



Bleed air from type "S":

1. Remove the protective cap ①.
2. Loosen the air-bleed screw ② by 2 turns.
3. Operate the valve until no more air bubbles escape.
4. Tighten the air-bleed screw ② (observe tightening torque M_A).
5. Remount the protective cap ①.



Emergency manual flow setting

The valve with the screw-type emergency override (Type "S") includes an integrated emergency manual flow setting. The emergency manual flow setting allows the required flow rate to be adjusted mechanically in the event of a failure of the proportional solenoid.



INFO

The manual flow setting is not designed for adjusting the flow rate in a dynamic control mode.

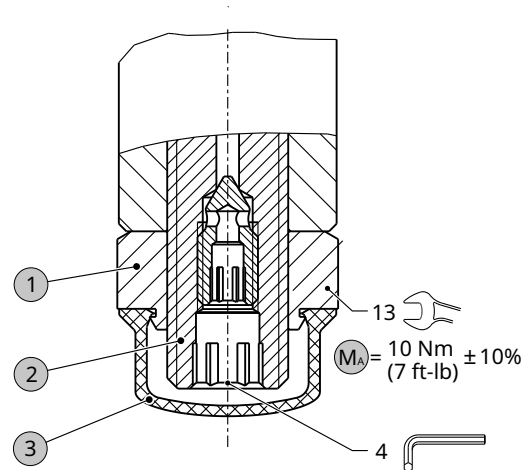
Setting the flow rate manually:

1. Remove the protective cap ③.
2. Loosen the lock nut ①.
3. Screw in the adjusting spindle ② until the required flow rate is set.
4. Tighten the lock nut ① (observe tightening torque M_A).
5. Remount the protective cap ③.

Reset to factory settings:

✓ Prerequisite: Solenoid de-energized.

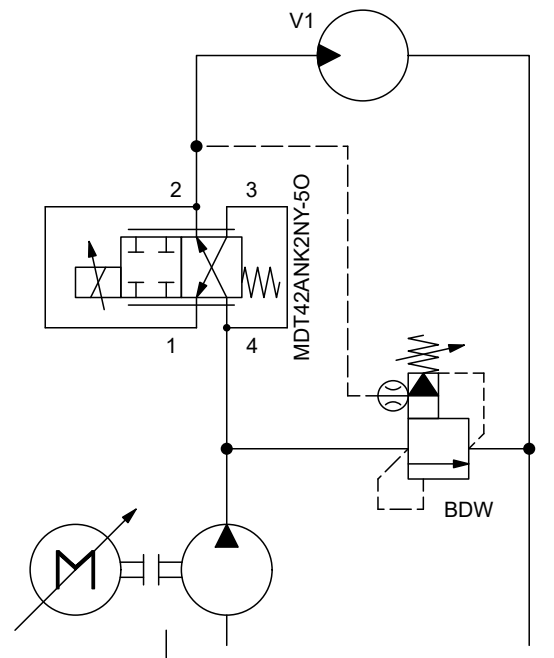
1. Remove the protective cap ③.
2. Loosen the lock nut ①.
3. Unscrew the adjusting spindle ② to its end-stop, then screw it in 2 turns.
4. Tighten the lock nut ① (observe tightening torque M_A).
5. Remount the protective cap ③.



Application examples

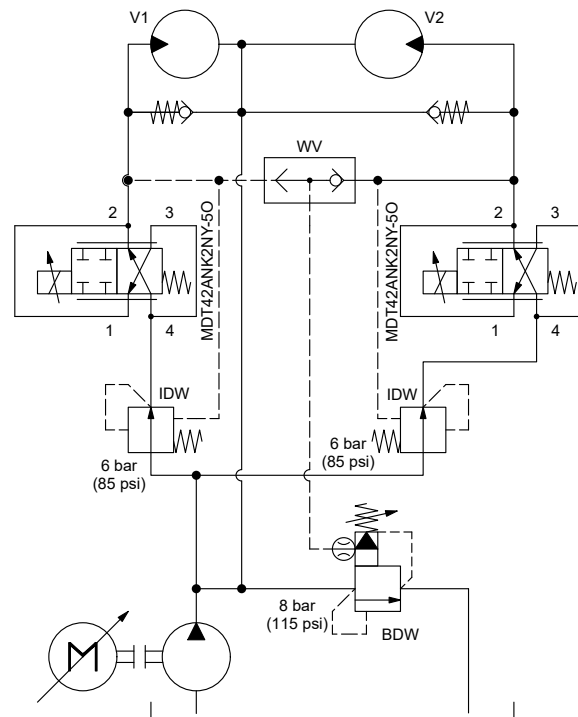
Used with a bypass hydrostat

Application example with a bypass hydrostat.



Classic combination

Classic combination with inline and bypass pressure-compensator cartridges.



Ordering code

Ex.	M	D	T	42	ANK2	N	Y	-	5	O	-	1	-	24	D	-	-	-
M	= flow-control valve (throttle cartridge)																	
D	= direct acting																	
T	= electrically operated, COIL 36X48..., 30 W, Prop.																	
42	= 4-way/2-position																	
ANK2	= ANK2 spool with dual flow-path (de-energized open)																	
N	= cavity type AN																	
Y	= only for use with pressure compensator																	
5	= nominal size 05																	
O	= without emergency override (standard)																	
P	= emergency override pin																	
S	= emergency override screw-type																	
N	= NBR (nitril-butadien-rubber / BUNA) seals (standard)																	
V	= FKM (fluorocarbon rubber / VITON) seals (special seals on request)																	
1 ... 9	= technical design no. (omit when ordering)																	
...	= voltage e.g. 24 (24 V)																	
D	= current DC																	
G	= DIN EN 175301-803 connection 3-pole 2 P+E (standard) (IP 65)																	
J	= Junior Timer plug connection 2-pole radial (IP 65)																	
JT	= Junior Timer plug connection 2-pole radial, with protection diode (IP 65)																	
U	= Deutsch plug connection DT04-2P 2-pole radial (IP 67/69K)																	
UR	= Deutsch plug connection DT04-2P 2-pole radial, with protection diode (IP 67/69K)																	
(blank)	= connection without mating plug (standard)																	
Q	= only connection "G" with mating plug																	

Related data sheets

Reference	Description
400-P-040011	form tools
400-P-040191	cavity AN
400-P-010101	MTTFd Values for Hydraulic Valves
400-P-120112	solenoid coil Coil 36X48-161

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