# Technical Data Sheet M-LT 304

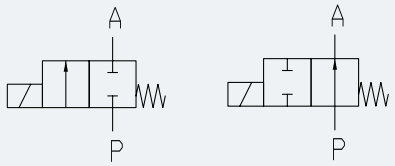
2/2-Way solenoid valve – valve normally closed (NC).
When energized the solenoid first opens the pilot hole and then lifts directly or supported by a pressure difference the piston from the valve seat. The valve is closed by spring power.

## Solenoid valve for cryogenic fluids

- For cryogenic media to -196 °C (incl. LNG)
- No pressure difference is required
- High life time
- Simple compact valve design
- Reliable and sturdy sealing elements
- Long-term availability of spare parts
- High-quality materials
- NO (normally open) available
- Welding ends available
- Flange design available

# TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Type of control: | Force pilot operated, no pressure difference required |
| Design: | Piston design |
| Connection: | Female thread acc. to DIN ISO 228<br>Welding ends, NPT on request<br>Further connections like flanges acc. to EN 1092 are available on request |
| Installation: | Actuator only in upright position |
| Pressure: | 0-16 bar and 0-40 bar (see table page 2) |
| Medium: | Clean, neutral, gaseous and liquid medium |
| Viscosity: | 22 $mm^2/s$ |
| Temperature range: | Medium: -196 °C up to +60 °C<br>Ambient: -40 °C up to +50 °C<br>In consideration of the restrictions described on page 6 |
| Body material: | PN16: Brass<br>PN16: Stainless steel 1.4581<br>PN50: Stainless steel 1.4404 |
| Metallic inner parts: | Brass and stainless steel |
| Sealing: | PTFE |

| | |
|---|---|
| Supply voltage: | AC~ 24V, 110V, 230V; 50-60Hz<br>DC= 12V, 24V, 110V<br>Other supply voltages on request |
| Voltage tolerance: | -10% / +10% |
| Power consumption: | A05 = 24 Watt E05 = 24 Watt<br>A06 = 30 Watt E06 = 24 Watt<br>A07 = 46 Watt E07 = 30 Watt<br>A08 = 100 Watt E08 = 47 Watt |
| Protection class: | IP65 according to DIN EN 60529 |
| Duty factor: | 100% ED-VDE 0580 |
| Ex-proof: | Ex e mb II T4<br>Further Ex-proof on request |
| Function: |   |
| Certificates: | |

# ORDERING SYSTEM

| M-LT | 3 | 04 | -S | -D | -13.5 | -C | -D | -A05 |
|---|---|---|---|---|---|---|---|---|
| Type | Control type | Code | Connection type | Connection size | Nominal diameter mm | Body material | Sealing material | Solenoid coil system |

| Control type | |
|---|---|
| 3 | Force pilot operated |

| Connection type | |
|---|---|
| G | BSP |
| N | NPT |
| S | Special |

| Connection size | |
|---|---|
| B | 1/4" |
| C | 3/8" |
| D | 1/2" |
| E | 3/4" |
| F | 1" |
| G | 1 1/4" |
| H | 1 1/2" |
| I | 2" |

| Body material | |
|---|---|
| A | Brass |
| C | Stainless steel AISI316(Ti) (1.4571, 1.4581) |
| D | Stainless steel AISI316(L) (1.4401, 1.4404) EN-GJS-400-18-LT |

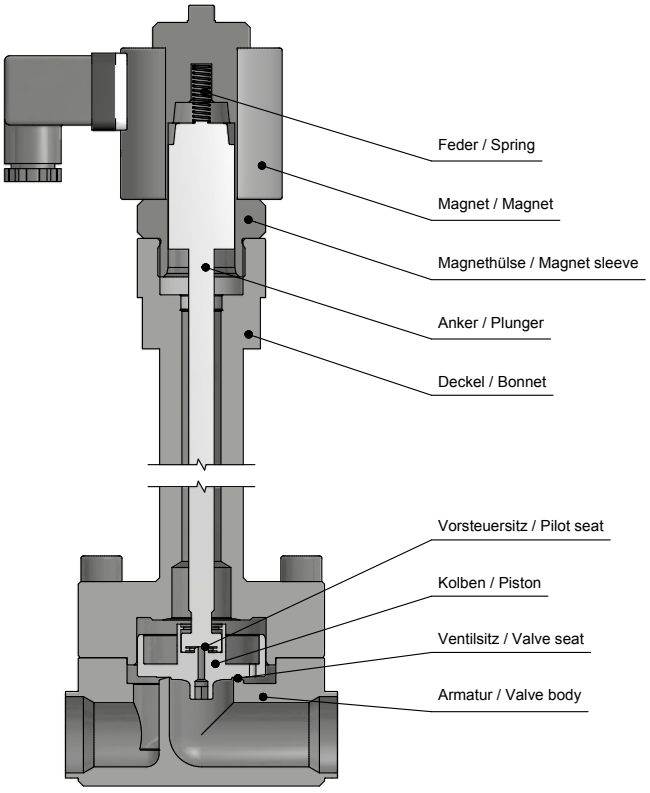
| Sealing material | |
|---|---|
| D | PTFE |

| Solenoid coil system | |
|---|---|
| A | Standard IP65 |
| E | Explosion-proof acc. to 94/9/EG (ATEX) |

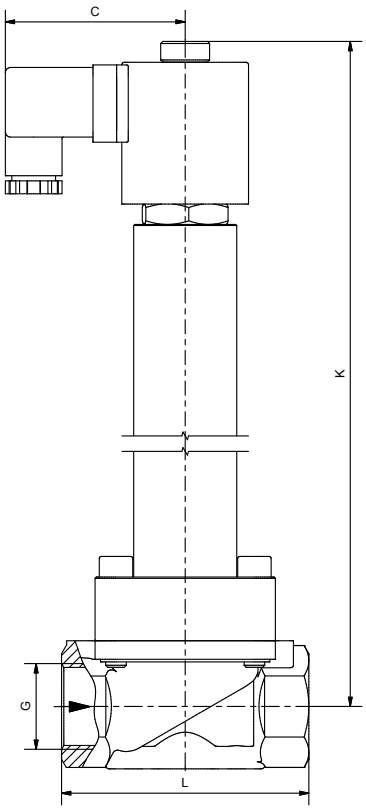
# Technical Features

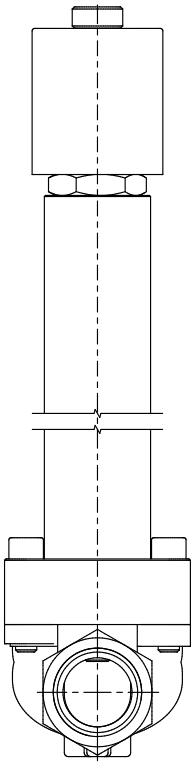
| PN16 | | | | max. pressure | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Standard type | G | Seat ø mm | Kv-value m³/h | | | | ATEX | | |
| | | | | A05 | A06 | A07 | E06 | E07 | E08 |
| M-LT 304-?-B | 1/4 | 13,5 | 1,7 | 0-16 | - | - | 0-16 | - | - |
| M-LT 304-?-C | 3/8 | 13,5 | 3,8 | 0-16 | - | - | 0-16 | - | - |
| M-LT 304-?-D | 1/2 | 13,5 | 4,4 | 0-16 | - | - | 0-16 | - | - |
| M-LT 304-?-E | 3/4 | 25 | 11,2 | 0-16 | - | - | 0-16 | - | - |
| M-LT 304-?-F | 1 | 27,5 | 13,0 | 0-16 | - | - | 0-16 | - | - |
| M-LT 304-?-G | 1 1/4 | 40 | 28,5 | - | 0-16 | - | - | 0-16 | - |
| M-LT 304-?-H | 1 1/2 | 40 | 32,0 | - | 0-16 | - | - | 0-16 | - |
| M-LT 304-?-I | 2 | 50 | 47,0 | - | - | 0-16 | - | - | 0-16 |

| PN50 | | | | max. pressure | | | | |
|---|---|---|---|---|---|---|---|---|
| Standard type | DN | Seat ø mm | Kv-value m³/h | | | | ATEX | |
| | | | | A06 | A07 | A08 | E07 | E08 |
| M-LT 304-?-D | 1/2-15 | 13,5 | 4,5 | 0-40 | - | - | 0-40 | - |
| M-LT 304-?-E | 3/4-20 | 25 | 11,5 | 0-40 | - | - | 0-25 | 0-40 |
| M-LT 304-?-F | 1-25 | 27,5 | 13,0 | 0-40 | - | - | 0-25 | 0-40 |
| M-LT 304-?-G | 1 1/4-32 | 40 | 29,0 | - | 0-25 | 0-40 | 0-25 | 0-40 |
| M-LT 304-?-H | 1 1/2-40 | 40 | 33,0 | - | 0-25 | 0-40 | 0-25 | 0-40 |
| M-LT 304-?-I | 2-50 | 50 | 47,0 | - | - | 0-40 | - | 0-40 |



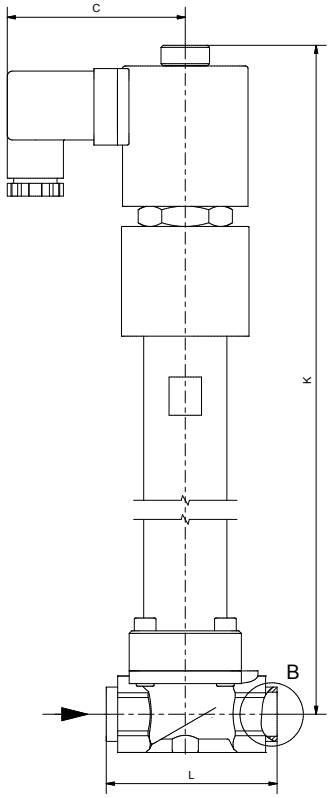
# Dimensions

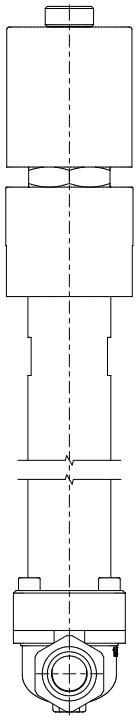


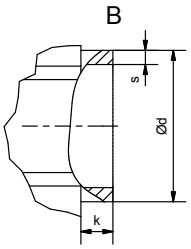



| PN16 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Coil | A05 | | | | | A06 | | A07 | | |
| Type | M-LT 304-?-B | M-LT 304-?-C | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| G | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 1/4 | 1 1/2 | 2 |
| C | 70 | 70 | 70 | 70 | 70 | 77 | 77 | 93 | 93 | 93 |
| K | 365 | 365 | 365 | 400 | 400 | 475 | 475 | 500 | 500 | 510 |
| L | 67 | 67 | 67 | 96 | 96 | 140 | 140 | 140 | 140 | 168 |
| kg | 2,2 | 2,2 | 2,2 | 4,4 | 4,4 | 8,8 | 8,8 | 9,7 | 9,7 | 10,3 |
| Coil | E06 | | | | | | | E07 | | E08 |
| Type | M-LT 304-?-B | M-LT 304-?-C | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| G | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 1/4 | 1 1/2 | 2 |
| C | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 93 | 93 | 106 |
| K | 370 | 370 | 370 | 405 | 405 | 475 | 475 | 500 | 500 | 560 |
| L | 67 | 67 | 67 | 96 | 96 | 140 | 140 | 140 | 140 | 168 |
| kg | 3,3 | 3,3 | 3,3 | 5,4 | 5,4 | 9 | 9 | 9,8 | 9,8 | 13 |

# Dimensions

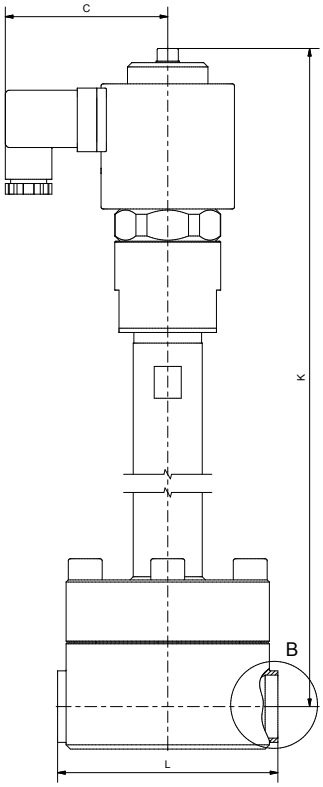


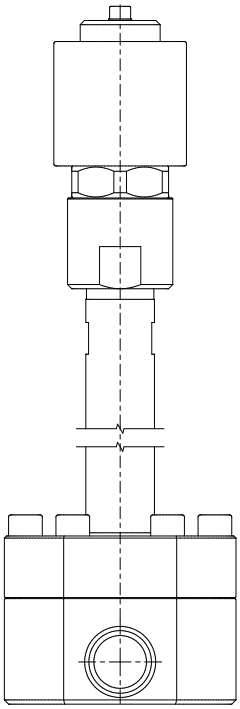



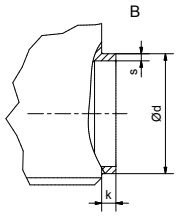



| PN16 | | | | | | |
|---|---|---|---|---|---|---|
| Coil | A05 | | A06 | | | A07 |
| Type | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| DN | 13,5 | 25 | 27,5 | 40 | 40 | 50 |
| C | 70 | 70 | 77 | 77 | 77 | 93 |
| K | 385 | 420 | 425 | 495 | 495 | 530 |
| L | 67 | 96 | 96 | 140 | 140 | 168 |
| d | 24 | 30 | 36 | 45 | 52 | 65 |
| s | 3,5 | 4 | 4 | 5 | 5,5 | 5,5 |
| k | 12 | 12 | 14 | 17 | 18 | 22 |
| kg | 2,2 | 4,4 | 5,3 | 8,8 | 8,8 | 10,3 |
| Coil | E06 | | E07 | | | E08 |
| Type | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| DN | 13,5 | 25 | 27,5 | 40 | 40 | 50 |
| C | 83 | 83 | 83 | 93 | 93 | 106 |
| K | 390 | 425 | 425 | 505 | 505 | 560 |
| L | 67 | 96 | 96 | 140 | 140 | 168 |
| d | 24 | 30 | 36 | 45 | 52 | 65 |
| s | 3,5 | 4 | 4 | 5 | 5,5 | 5,5 |
| k | 12 | 12 | 14 | 17 | 18 | 22 |
| kg | 3,3 | 5,4 | 5,4 | 9,8 | 9,8 | 13 |

# Dimensions






| PN50 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Coil | A06 | | | A07 | | A08 | | |
| Type | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| DN | 13,5 | 25 | 27,5 | 40 | 40 | 40 | 40 | 50 |
| C | 77 | 77 | 77 | 93 | 93 | 107 | 107 | 107 |
| K | 408 | 424 | 424 | 505 | 505 | 525 | 525 | 560 |
| L | 80 | 104 | 102 | 148 | 147 | 148 | 147 | 178 |
| d | 24 | 30 | 36 | 45 | 52 | 45 | 52 | 65 |
| s | 3,5 | 4 | 4 | 5 | 5,5 | 5 | 5,5 | 5,5 |
| k | 2 | 4 | 4 | 4 | 3,5 | 4 | 3,5 | 4 |
| kg | 3,3 | 5,4 | 5,4 | 9,8 | 9,8 | 12,3 | 12,3 | 13 |

| Coil | | | | E08 | | |
|---|---|---|---|---|---|---|
| Type | M-LT 304-?-D | M-LT 304-?-E | M-LT 304-?-F | M-LT 304-?-G | M-LT 304-?-H | M-LT 304-?-I |
| DN | 13,5 | 25 | 27,5 | 40 | 40 | 50 |
| C | 93 | 93 | 93 | 106 | 106 | 106 |
| K | 418 | 434 | 434 | 535 | 535 | 560 |
| L | 80 | 104 | 102 | 148 | 147 | 178 |
| d | 24 | 30 | 36 | 45 | 52 | 65 |
| s | 3,5 | 4 | 4 | 5 | 5,5 | 5,5 |
| k | 2 | 4 | 4 | 4 | 3,5 | 4 |
| kg | 4,5 | 6,6 | 6,6 | 12,3 | 12,3 | 13 |

# Information

- It is imperative to observe the installation and safety instructions in our operating and service manuals.
- For information on our **GVT** ordering code, please refer to our catalogs. If you have any questions, we will be glad to assist you.
- Required ordering information: valve type, function NC/NO, pressure range, connection, nominal width, medium, flow rate, medium and ambient temperatures, connection voltage.
- **Detailed production-specific drawings and other technical information will be made available when an order is placed.**

## PLEASE NOTE

Each individual application decides which valve type is required, the main factor being the resistance of the materials to the operating medium. The correct selection of materials requires knowledge of the concentration, temperature and degree of contamination of the medium. Other criteria include the operating pressure and max. volumetric flow, since , in addition to high temperatures , high pressures and high flow rates must also be taken into account when selecting the materials.
**All materials used for our valves, be it housing, seals or magnets, will be carefully selected in view of the different application areas. Any information given is non-binding and serves for orientation only. No claims under warranty can be derived therefrom.**

### Heating and power of solenoid coils

The default solenoid valves are designed for continuous operation (100% ED = power-on time) under normal operating conditions.
The pulling force of a solenoid coil is basically influenced by three elements:

- The self-heating of the magnetic coil
- The medium temperature
- The ambient temperature

Solenoid coils are by default designed for a maximum ambient temperature of +40 °C. This specification applies for the maximum allowable operating pressure specified in the data sheet of the corresponding valve and a medium temperature of +80 °C.
A higher ambient temperature is possible, when lower values are applied for the other influencing parameters. When the max. operation pressure and max. ambient temperature of +50 °C is given the medium temperature is not allowed to be higher than max. +50 °C. In addition to that, deviations from the default design temperature range are possible, e.g. when coils or other constructive measures are used.
More precise specifications and technical data with regard to the operating conditions can be found in the data sheets of the solenoid coils and the solenoid valve regarded. Please observe that the surface temperature of a permanently loaded coil can amount up to +120 °C, solely by the self-heating of the coil. The power consumption of our default solenoid valves was calculated to DIN VDE 05820 for a coil temperature of +20 °C.



**State: 04/2016, MK-MG, Version 1.**