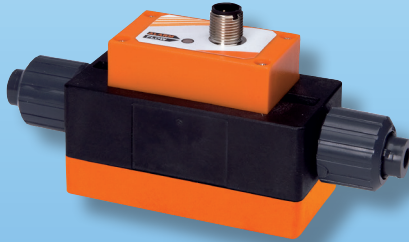


Compact Magneto-Inductive Flowmeter



measuring
•
monitoring
•
analyzing

MIK



- Flow Ranges: 0.18...7.8 GPH to 9...180 GPM
- Accuracy: $\pm 2\%$ of Full Scale
- p_{\max} : 145 psi; t_{\max} : 176 °F
- Connection: G $\frac{1}{2}$...G 2 $\frac{1}{4}$ Male with Optional NPT, Socket, and Hose Connections
- Materials: PPS Body with Stainless Steel or Hastelloy® Electrodes; PVDF Body with Hastelloy® or Tantalum Electrodes
- Electronic Packages: Frequency, Current or Voltage Outputs, Adjustable Switches, and Integral Totalizers or Batch Controllers
- Highlights:
 - No Moving Parts in the Flow Body
 - Low Pressure Loss
 - Universal Mounting
 - High Quality at a Low Price



KOBOLD companies worldwide:

AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA, CZECHIA, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, RUSSIA, SPAIN, SWITZERLAND, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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Pittsburgh, PA 15205
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1.412.788.4890
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Description

The KOBOLD MIK flow meter is used for measuring and monitoring small to medium-sized flows of conductive liquids in pipes. The sensor operates according to the electromagnetic measurement principle. According to Faraday's Law of magnetic induction, a voltage is induced in a conductor moving through a magnetic field. The electrically conductive media acts as the conductor. The voltage induced in the media is proportional to the flow velocity and is therefore a value for the volumetric flow. The media must have a minimum conductivity of 30 µS /cm (200 µS /cm for U0 & U1 ranges) for proper operation. The induced voltage is picked up by two sensing electrodes which are in contact with the media and sent to the measuring amplifier. The flow rate will be calculated based on the cross sectional area of the pipe.

The measurement is not dependent on the process liquid and its material properties such as density, viscosity, and temperature. The device may be equipped with a switch, frequency, or analog output. The device also has a universal compact-type electronic which features two configurable outputs and a rotatable display.

Compact Electronic Features

- Flow and Temperature Measurement
- Switching, Transmitting, and Batching Functions
- Batching Function with External Control Input
- Colored, Multi-parameter Configurable TFT-Display, Rotatable in 90° steps
- Bi-Directional Flow Measurement
- Intuitive Setup Menu via 4 Optical Touch Keys
- 2 Configurable Outputs (Pulse/Frequency/Alarm/Analog Output)
- Grand and Resettable Totalizer
- IO Link Function

Media

- Conductive Liquids
- Acids and Caustic Solutions
- Drinking, Cooling, and Waste Water
- Ground Water, Raw Water
- Aggressive or Salty Solutions
- Unsuitable for Oils & Other Low or Non-Conductive Media

Areas of Application

Flow Monitoring, Flow Measuring, Batching and Totalizing for:

- Machine Building
- Chemical Industry
- Paper Industry
- Automobile Industry
- Cement Industry
- Laboratories

Technical Data

- Range:** See Table
- Accuracy:** ±2.0 % of f. s.
- Repeat Accuracy:** ±1.0 % of f. s. (f. s. = full scale)
- Measurement Process:** Electromagnetic
- Electrical Conductivity:** Min. 30 µS /cm (MIK-..U0.. & MIK-..U1.., Min. 200 µS /cm)
- Mounting Position:** Universal, Flow in Direction of the Arrow
- Inlet/Outlet Straight Run:** 3 x PD / 2 x PD (Pipe Diameters)
- Media Temperature:** -4 ... 176 °F (max. 140 °F with PVC-connection Set)
- Ambient Temperature:** 14 ... 140 °F
- Max. Pressure:** 145 psi
- Max. Pressure Loss:** Max. 3.7 psi at f.s.
- Max. Media Viscosity:** Max. 20 cSt for ranges: U0...U8
Max. 70 cSt for ranges: UA...UH

Wetted Parts

- Sensor Housing:** PPS or PVDF, Fiberglass-reinforced
- Native Connection:** G 1/2 to G 2-3/4
- Optional Connection Set:** NPT, PVC-gluе Connections, Hose Barb, or Butt Weld Connections 316L Stainless Steel
- Electrodes:** 316L Stainless Steel, Hastelloy C4, or Tantalum
- Seal:** NBR, FKM, or FFKM
- Response Time t₉₀:** ca. 1 s
- Protection:** IP 65

Connection/Ranges

| Native Connection | Inside Diameter | Flow Velocity at f.s. | Range |
|-------------------|-----------------|-----------------------|------------------|
| G ½ male | 5 mm | approx. 0.45 m/s | 0.18... 7.8 gph |
| | | approx. 0.9 m/s | 0.78... 15.6 gph |
| | | approx. 2.7 m/s | 2.4... 48.0 gph |
| G ¾ male | 10 mm | approx. 2.2 m/s | 0.13 ... 2.6 gpm |
| | | approx. 3.5 m/s | 0.2 ... 4.0 gpm |
| G 1 male | 15 mm | approx. 3.0 m/s | 0.4 ... 8.0 gpm |
| | | approx. 4.7 m/s | 0.65 ... 13 gpm |
| G 1 ½ male | 20 mm | approx. 3.3 m/s | 0.8... 16 gpm |
| | | approx. 5.3 m/s | 1.3 ... 26 gpm |
| G 2 male | 32 mm | approx. 3.3 m/s | 2.0 ... 40 gpm |
| | | approx. 5.9 m/s | 4.0 ... 75 gpm |
| G 2 ¾ male | 54 mm | approx. 3.6 m/s | 6.5 ... 130 gpm |
| | | approx. 5.1 m/s | 9.0 ... 180 gpm |

**MIK-...F300, MIK-...F390**

| | |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Pulse Output: | PNP, Open Collector, max. 200 mA 500 Hz at f. s. (...F300) 50...1000 Hz at f. s. (...F390) Factory Set as per Customer Request |
| Power Supply: | 24 V _{DC} ±20 % |
| Power Consumption: | 60 mA |
| Electrical Connection: | Plug M 12 x 1 |

MIK-...S300, MIK-...S30D

| | |
|-------------------------------|-----------------------------------------------------------------------------------|
| Display: | Duo-LED for Switch Status |
| Switching Output: | Relay SPDT, Max. 1A/30V _{DC} or Active 24 V _{DC} , N/C / N/O |
| Switch Point: | 10 ...100% of f. s. in 10%-Steps User Configured via Rotary Switch |
| Power Supply: | 24 V _{DC} ±20 % |
| Power Consumption: | 80 mA |
| Electrical Connection: | Plug M 12 x 1, 5-pin |

MIK-...L343

| | |
|-------------------------------|-------------------------|
| Output: | 4-20 mA, 3-wire |
| Max. Load: | 500 Ω |
| Power Supply: | 24 V _{DC} ±20% |
| Power Consumption: | 80 mA |
| Electrical Connection: | Plug M 12 x 1 |

MIK-...L443 (Optional Use with AUF-3000)

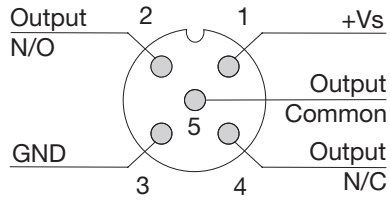
| | |
|-------------------------------|-------------------------|
| Output: | 4-20 mA, 3-wire |
| Max. Load: | 500 Ω |
| Power Supply: | 24 V _{DC} ±20% |
| Power Consumption: | 80 mA |
| Electrical Connection: | Plug DIN 43650 |

MIK-...C3T0 (Compact Electronics)

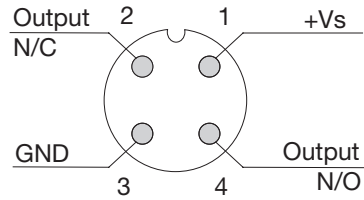
| | |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply Voltage: | 19-30 V _{DC} , Max. Internal Power Consumption: 200 mA |
| Display: | TFT Display, 128x128 Pixels, 1.4" Display, Orientation Adjustable in 90° Increments |
| Display Repetition Rate: | 0.5... 10 s, Adjustable |
| Pulse Output: | Push-Pull, Freely Scalable, Configurable for Partial and Accumulated Totalizer |
| Frequency Output: | Push-Pull, Fully Scalable, 2 kHz at Overflow 50... 1000 Hz at Full Scale, User Programmable |
| Alarm Output: | NPN, PNP, Push-Pull, Configurable Max. 30 V _{DC} , Max 200 mA, Short-Circuit Proof |
| Control Output: | Active Signal U _{high} Max. 30 V _{DC} , 0 < Low < 10 V _{DC} , 15 V _{DC} < High < V _s |
| Batching Function: | Batching Output OUT2: Push-Pull, High Active Control Input OUT1: START/STOP 0.5s < t _{high} < 4s RESET t _{high} > 5s |
| Shock Resistance | DIN EN 60068-2-27:2010: 20 g (11 ms) |
| Vibration Resistance | DIN EN 60068-2-6:2008: 5 g (10... 2000 Hz) |
| Environmental Testing | DIN EN 60068-2-30:2006: Severity Level b |
| Temperature Measurement (C3T0) | |
| Sensor: | Digital |
| Accuracy: | ≤ +2°C (Flow > 0.2 m/s) |
| Measuring Range: | Temperature Range of Medium |
| Response Time Temperature t₉₀ (Signal Output): | < 20 s |
| IO-Link Specification | |
| Manufacturer ID: | 1105 (Decimal), 0 x 0451 (Hex) |
| Manufacturer Name: | Kobold Messring GmbH |
| IO-Link Specification: | V1.1 |
| Bitrate: | COM3 |
| Minimal Cycle Time: | 1.1 ms |
| SIO-Mode: | Yes (OUT1 in Configuration IO-Link) |
| Block Parameterisation: | Yes |
| Operational Readiness: | 10 s |
| Max. Cable Length: | 65.5 ft (20 m) |

Electrical Connections

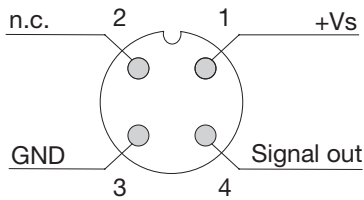
MIK-...S300



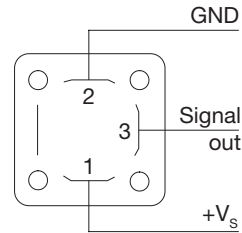
MIK-...S30D



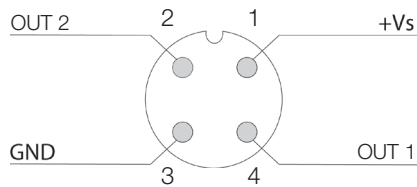
MIK-...L343, MIK-...F3x0



MIK-...L443



MIK-...C30x



MIK-...C34x

Configuration of Outputs (C3T0)

| Output 1 (OUT1, PIN 4) | Output 2 (OUT2, PIN2) |
|--------------------------------------------------|------------------------------------|
| Analog Output 0-10 V _{DC} | Analog Output 0-10 V _{DC} |
| Analog Output 4-20 mA | Analog Output 4-20 mA |
| Switching Output NPN/PNP/PP | Switching Output NPN/PNP/PP |
| Pulse Output PP | Pulse Output PP |
| Frequency Output PP | Frequency Output PP |
| Communication Mode KofiCom | |
| Communication Mode IO-Link | |
| Control Input | |
| Control Input Start/Stop/Reset Batching Function | Batching Function Switch/PP |

Compact Magneto-Inductive Flowmeter Model MIK



Order Details (Example: **MIK-5NA U5 A F300**)

| Model | Measuring Range, Native Process Connection | Optional Fitting Set | Output/Electronics |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MIK-5NA.. = PPS-Housing, NBR-Seal, Stainless Steel Electrode | ..U0.. = 0.18...7.8 GPH, G ½ ..U1.. = 0.78...15.6 GPH, G ½ ..U2.. = 2.4...48.0 GPH, G ½ | ..A.. = Without ¹⁾ ..N.. = PVC, 1/4" NPT Female ..P.. = PVC, 1/2" Hose Barb | Frequency Output ..F300 = M12-plug, 500 Hz ..F390 = M12-plug, 50...1000 Hz ²⁾ Switching Output ..S300 = Relay, M12-plug ..S30D = Active 24 V _{DC} , M12-plug Analog Output ..L343 = M12-plug, 4 - 20 mA ..L443 = DIN-plug, 4 - 20 mA Compact Electronic ..C3T0 = Compact TFT Display 2x Configurable Outputs (Current/Voltage/Pulse/ Frequency/Alarm) M12x1 Electrical Connection |
| | ..U4.. = 0.13...2.6 GPM, G ¾ ..U5.. = 0.2...4.0 GPM, G ¾ | ..A.. = Without ¹⁾ ..M.. = PVC, 3/8" PVC Glue Socket ..N.. = PVC, 3/8" NPT Female ..P.. = PVC, 3/4" Hose Barb ..R.. = Polypropylene, 3/8" NPT Female | |
| MIK-5VA.. = PPS-Housing, FKM-Seal, Stainless Steel Electrode | ..U7.. = 0.4...8.0 GPM, G 1 ..U8.. = 0.65...13 GPM, G 1 | ..A.. = Without ¹⁾ ..H.. = PVDF, 1/2" NPT Female ..M.. = PVC, 1/2" Glue Socket ..N.. = PVC, 1/2" NPT Female ..P.. = PVC, 1" Hose Barb ..R.. = Polypropylene, 1/2" NPT Female ..V.. = PVDF, Butt Weld 20mm O.D. Tube ..W.. = 316L SS, 1/2" NPT Female ..X.. = Brass, 1/2" NPT Female | |
| MIK-5NC.. = PPS-Housing, NBR-Seal, Hastelloy®- Electrode | ..UA.. = 0.8...16 GPM, G 1½ ..UB.. = 1.3...26 GPM, G 1½ | ..A.. = Without ¹⁾ ..H.. = PVDF, 1" NPT Female ..M.. = PVC, 1" Glue Socket ..N.. = PVC, 1" NPT Female ..R.. = Polypropylene, 1" NPT Female ..V.. = PVDF, Butt Weld 32mm O.D. Tube | |
| MIK-5VC.. = PPS-Housing, FKM-Seal, Hastelloy®- Electrode | ..UD.. = 2.0...40 GPM, G 2 ..UE.. = 4.0...75 GPM, G 2 | ..A.. = Without ¹⁾ ..H.. = PVDF, 1-1/4" NPT Female ..M.. = PVC, 1-1/4" Glue Socket ..N.. = PVC, 1-1/4" NPT Female ..R.. = Polypropylene, 1-1/4" NPT Female | |
| MIK-6FC.. = PVDF-Housing, FFKM-Seal, Hastelloy®- Electrode | ..UG ⁴⁾ .. = 6.5...130 GPM, G 2 ¾ ..UH ⁴⁾ .. = 9.0...180 GPM, G 2 ¾ | ..A.. = Without ¹⁾ ..H.. = PVDF, 2" NPT Female ..M.. = PVC, 2" Glue Socket ..N.. = PVC, 2" NPT Female ..R.. = Polypropylene, 2" NPT Female | |
| MIK-6FT.. = PVDF-Housing, FFKM-Seal, Tantalum- Electrode | | | |
| Accessories: P/N 807.037 = 4-pin Micro-DC connector with 6-foot cable for output types F300, F390, L343, S30D, & C3T0 P/N 807.007 = 5-pin Micro-DC connector with 6-foot cable for output type S300 | | | |

¹⁾ Incl. frontal gaskets (2 pc. O-rings)
²⁾ Please specify frequency at full scale in clear text when ordering
³⁾ Please specify cable length in clear text
⁴⁾ Not for MIK-5NC/-5VC

Sensor Weight (Total Weight = Sensor + Electronics)

| Model | PPS | PVDF |
|-----------------------------|-----------------|-----------------|
| MIK-...U0/U1/U2 (½") | approx. 0.40 lb | approx. 0.43 lb |
| MIK-...U4/U5 (¾") | approx. 0.42 lb | approx. 0.50 lb |
| MIK-...U7/U8 (1") | approx. 0.60 lb | approx. 0.72 lb |
| MIK-...UA/UB (1 ½") | approx. 0.90 lb | approx. 1.10 lb |
| MIK-...UD/UE (2") | approx. 1.24 lb | approx. 1.35 lb |
| MIK-...UG/UH (2 ¾") | approx. 2.65 lb | approx. 3.02 lb |

No responsibility taken for errors;
 subject to change without prior notice.

Electronics Weight (Total Weight = Sensor + Electronics)

| Model | Weight |
|----------------------------------------------------------------|-----------------|
| MIK-...F3x0 MIK-...S30x MIK-...Lxx3 | approx. 0.18 lb |
| MIK-...C3T0 | approx. 0.67 lb |

* Total Weight = Sensor Weight + Electronics Weight



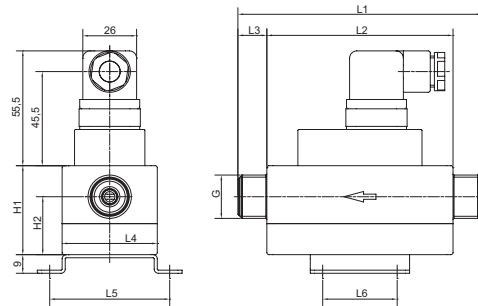
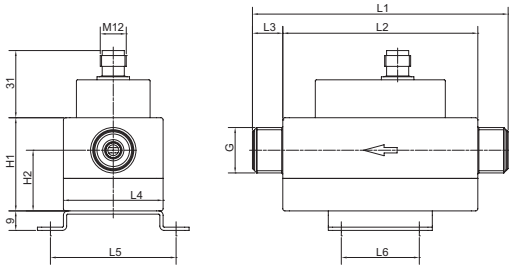
Compact Magneto-Inductive Flowmeter Model MIK

Dimensions

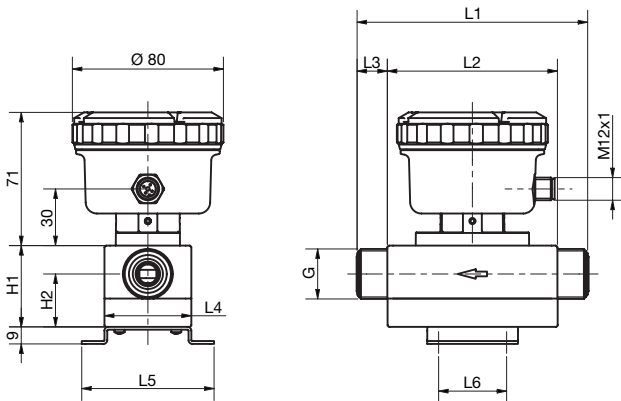
| Model | G | L1 | L2 | L3 | L4 | L5 | L6 | H1 | H2 |
|----------------------------------------|---------|-----|-----|----|----|-----|----|------|------|
| MIK-xxxU0A MIK-xxxU1A MIK-xxxU2A | G 1/2 | 118 | 90 | 14 | 46 | 58 | 36 | 43 | 28 |
| MIK-xxxU4A MIK-xxxU5A | G 3/4 | 122 | 90 | 16 | 46 | 58 | 36 | 43 | 28 |
| MIK-xxxU7A MIK-xxxU8A | G 1 | 126 | 90 | 18 | 46 | 58 | 36 | 49,5 | 29,5 |
| MIK-xxxUAA MIK-xxxUBA | G1 1/2 | 134 | 90 | 22 | 68 | 80 | 36 | 66 | 31,5 |
| MIK-xxxUDA MIK-xxxUEA | G 2 | 138 | 90 | 24 | 68 | 80 | 36 | 72 | 36 |
| MIK-xxxUGA MIK-xxxUHA | G 2 3/4 | 202 | 150 | 26 | 96 | 110 | 75 | 104 | 52 |

MIK-...F3x0, MIK-...S30x, MIK-...L343

MIK-...L443



MIK-...C3xx



Dimensions Fitting Set ..H, M, N, R, W, X.. Connection

Reference table 7.1...table 7.5

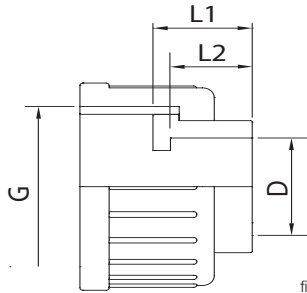


fig. 7.1

Dimensions Fitting Set ..N.. PVC- 1/4" NPT Connection

Reference table 7.1 G 1/2 only

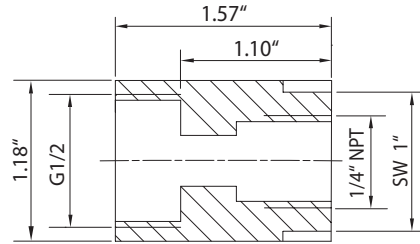


fig. 7.2

Dimensions Fitting Set ..N.. PVC-NPT Connection

| G | L1 | L2 | D |
|---------|---------------------|-------|-------------|
| G 1/2 | Refer to figure 7.2 | | 1/4" nom. |
| G 3/4 | 0.68" | 0.52" | 3/8" nom. |
| G 1 | 0.76" | 0.68" | 1/2" nom. |
| G 1 1/2 | 0.98" | 0.87" | 1" nom. |
| G 2 | 1.33" | 0.98" | 1-1/4" nom. |
| G 2 3/4 | 1.61" | 0.98" | 2" nom. |

table 7.1

Dimensions Fitting Set ..H.. PVDF-NPT Connection

| G | L1 | L2 | D |
|---------|-------|-------|-------------|
| G 1 | 0.96" | 0.79" | 1/2" nom. |
| G 1 1/2 | 1.09" | 0.83" | 1" nom. |
| G 2 | 1.34" | 0.91" | 1-1/4" nom. |
| G 2 3/4 | 1.65" | 1.22" | 2" nom. |

table 7.3

Dimensions Fitting Set ..R.. PP-NPT Connection

| G | L1 | L2 | D |
|---------|-------|-------|-------------|
| G 3/4 | 0.68" | 0.55" | 3/8" nom. |
| G 1 | 0.98" | 0.79" | 1/2" nom. |
| G 1 1/2 | 1.24" | 0.94" | 1" nom. |
| G 2 | 1.48" | 1.18" | 1-1/4" nom. |
| G 2 3/4 | 1.68" | 1.22" | 2" nom. |

table 7.4

Dimensions Fitting Set ..M.. PVC-IPS Glue Connection

| G | L1 | L2 | D |
|---------|-------|-------|-------------|
| G 3/4 | 0.87" | 0.79" | 3/8" nom. |
| G 1 | 1.0" | 0.89" | 1/2" nom. |
| G 1 1/2 | 1.24" | 1.14" | 1" nom. |
| G 2 | 1.51" | 1.39" | 1-1/4" nom. |
| G 2 3/4 | 1.61" | 1.5" | 2" nom. |

table 7.2

Dimensions Fitting Set ..W, X.. SS/Brass-NPT Connection

| G | L1 | L2 | D |
|-----|-------|-------|-----------|
| G 1 | 1.18" | 0.63" | 1/2" nom. |

table 7.5

Dimensions Fitting Set ..V.. Butt Weld

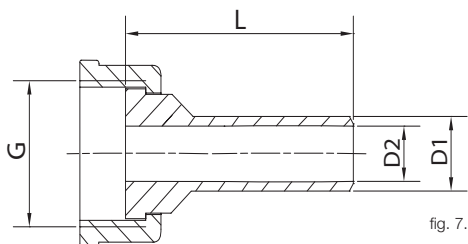


fig. 7.3

| G | L | D1 | D2 |
|---------|-------|-------|-------|
| G 1 | 2.09" | 0.79" | 0.62" |
| G 1 1/2 | 2.32" | 1.26" | 1.05" |

table 7.6

Dimensions Fitting Set ..P.. PVC-Hose Connection

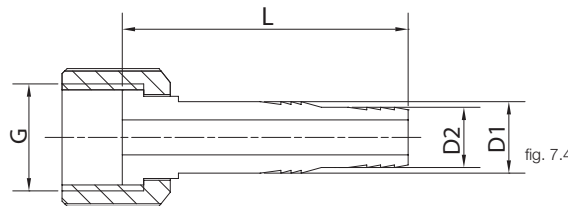


fig. 7.4

| G | L | D1 | D2 |
|-------|-------|-------|-------|
| G 1/2 | 2.2" | 0.55" | 0.47" |
| G 3/4 | 2.36" | 0.71" | 0.63" |
| G 1 | 2.64" | 0.87" | 0.79" |

table 7.7