# Measuring Systems


HYDROTECHNIK

# Contents

# Introduction

## Continuity and innovation

Information is valuable, especially when it comes from inside complex technical structures and installations. Use them to maintain an overview of state, quality and preformance, it provides hints on potential critical incidents or failures.

Hydrotechnik is focussed on the collection, recording and evaluation of information, especially from hydraulic plants and systems. We are the developper of the Minimess® test point and numerous other innovations. We provide a complete and rounded range of products to out customers, where a suitable solution can be assembled for nearly each application. In short, we offer „systemic measuring".

When the standard product range proves not to be sufficient, a special Hydrotechnik strength becomes visible. We are a company with lean structures and quick decisions. This allows us to develop customer specific solutions and adaptations of our products in a fast and cost-effective way.

By the use of modern tools and methods in development, construction and production we are ready to react to customer requests and market developments quickly.

## Quality – our number one priority

For Hydrotechnik, 'Quality without Compromise' is not just a statement. It is a working reality. All areas of the company adhere to maintaining ISO 9001 standards, certification of which was awarded in 1996. To ensure maximum quality control, Hydrotechnik practices the highest standards of manufacturing at our works in Limburg, Germany.

Hydrotechnik has its own personnel to develop hard- and software, prototyping and serial production is done by Hydrotechnik electronics GmbH, a 100 % subsidiary at the same location. This results in advantages during the phases of development, and for the feedback into serial production.

Where in-house production is not possible, we work with well-known suppliers. When choosing our supply partners, we do not just look at cost but we insist on the ability to achieve our priority of quality. Strict control of the supplied components ensures that the products fully comply with our quality standards.

## Limitation of liability

The information contained in this catalog has been examined carefully. Nevertheless it is possible that printing or other errors are contained. Therefor we do not take any liability for the correctness of the contained information.

They must not be regarded as warranted characteristics, only the product descriptions contained in our offers are decisive. We reserve all changes due to the technical development and improvement of our products. All prior catalogs lose their validity.

The data contained in this catalog have to be seen as average values and are not binding. They can be used for constructional purposes in a limited way, only. Please ask for our technical data sheets and user manuals. The use of our products is at the sole responsibility of the customer. All deliveries are carried out solely on the basis of our conditions of sales and delivery. They can be accessed on our homepage www.hydrotechnik.com in the section „Impressum".

# Instrument feature icons

You will find icons at each measuring system in this catalog that shall indicate the most important instrument features. Here are the explanations of the used icons:


instrument is equipped with at least one analog input channel


instrument is equipped with at least one frequency input channel


instrument is equipped with at least one switchable input channel for analog or frequency


instrument is equipped with at least one digital input channel


instrument is equipped with at least one analog output channel


instrument is equipped with at least one digital output channel


instrument is equipped with the Intelligent Sensor Detection System (automatic programming of sensor parameters and calibration data)


instrument is able to display min and max values

display has background illumination

instrument can display values graphically (line diagram)


instrument can display values numerically

instrument has an internal memory


instrument is equipped with trigger and/or pretrigger (to start recordings when defined conditions are fulfilled)


instrument has an USB interface


instrument has an RS 232 interface


instrument can read-out, display and record data from a CAN bus


instrument is equipped with **HYDRO***com* 6 – Base version


instrument is equipped with **HYDRO***com* 6 – Full version


instrument is equipped with **HYDRO***link*


instrument will automatically remind the expiration of a defined calibration interval

# Performance overview

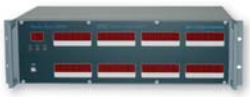
| MultiSystem measuring systems | | MultiSystem 8050 | MultiSystem 5060 *Plus* | MultiSystem 4010 |
|---|---|---|---|---|
| | |  |  |  |
| **Inputs** | analog / incl. highspeed | 12 / 2 | 6 / 2 | 3 / – |
| | frequency | 4 | 2 | 1 |
| | a/f switchable | – | – | 1 |
| | digital | 4 | 1 | 1 |
| | CAN | 6 / 14 (opt.) | 14 | 5 (opt.) |
| **Outputs** | digital | 4 | 1 | 1 |
| | analog | 2 | – | – |
| | relais | – | – | – |
| **Calcualted measuring values** | number | 6 / 14 (opt.) | 14 | 5 |
| | sum / difference | • / • | • / • | • / • |
| | performance | • | • | • |
| | dx / dt | • | • | • |
| | free formula definition | • | • | – |
| **ISDS** | | • | • | • |
| **Presentation** | Nº of pres. channels | 30 | 16 | 12 |
| | graphically | y = f(t) / y = f(x) | y = f(t) / y = f(x) | y = f(t) / y = f(x) |
| | color | • | • | • |
| | memory presentation | • | • | • |
| **Memory** | scan rate | 0.1 ms / 1 ms | 0,1 ms | 1 ms |
| | memory size / places | 256 MB / 200 | 2 GB / 200 | 2 GB / 100 |
| | trigger | • | • | • |
| | trigger link | • | • | – |
| | pretrigger | • | • | • |
| | cyclic recording | • | • | • |
| **Operation** | direct | – | – | – |
| | menu | • | • | • |
| | touchscreen | • | – | – |
| | PC operation / online mode | • / • | • / • | • / • |
| **Interfaces** | USB | • | • | • |
| | RS 232 | • | • | • |
| | RS 485 | – | – | – |
| **Linearisation** | | • | • | • |
| **Channel filter** | software / hardware filter | • / – | • / • | • / – |
| **Printer** | | • | • | – |
| **Battery operation** | | – | • | • |
| **A/D converter** | | 16 bit | 13 bit | 12 bit |

# Performance overview

| MultiBox and MultiHandy measuring instruments | | MultiBox 3060 / 3061 / 3065 | MultiHandy 3020 / 3025 | MultiHandy 2020 |
|---|---|---|---|---|
| | |  |  |  |
| **Inputs** | analog / incl. highspeed | 3 / – | 2 / – | 2 / – |
| | frequency | – | 1 | – |
| | a/f switchable | 1 | – | – |
| | digital | – | – | – |
| | CAN | – | – | – |
| **Outputs** | digital | – | – | – |
| | analog | – | – | – |
| | relais | – | – | – |
| **Calcualted measuring values** | number | 2 | 1 | 1 |
| | sum / difference | • / • | • / • | – / • |
| | performance | • | • | – |
| | dx / dt | – | • | – |
| | free formula definition | – | – | – |
| **ISDS** | | • | • | • |
| **Presentation** | Nº of pres. channels | 6[1] | 4 | 3 |
| | graphically | •[1] | – | – |
| | color | •[1] | – | – |
| | memory presentation | – | – | – |
| **Memory** | scan rate | 1 ms | 1 ms | 1 ms |
| | memory size / places | 2 GB / 200 | 2 MB / 14 | 128 kB / 1 |
| | trigger | • | • | – |
| | trigger link | option | – | – |
| | pretrigger | • | • | – |
| | cyclic recording | – | – | – |
| **Operation** | direct | – | • | • |
| | menu | – | • | • |
| | touchscreen | – | – | – |
| | PC operation / online mode | • / • | – / • | – / • |
| **Interfaces** | USB | • | • | •[2] |
| | RS 232 | – | – | – |
| | RS 485 | – | – | – |
| **Linearisation** | | • | •[3] | •[3] |
| **Channel filter** | software / hardware filter | – | – | – |
| **Printer** | | •[1] | – | – |
| **Battery operation** | | option | • | • |
| **A/D converter** | | 12 bit | 12 bit | 12 bit |

1: via PC
2: virtual COM interface
3: only with ISDS

# Performance overview

| | | MultiPanel 8050 | SEG 1060 | MultiEPC |
|---|---|---|---|---|
| **Stationary measuring systems** | |  |  |  |
| **Inputs** | analog / incl. highspeed | 12 / 2 | 1 / – | 1 / – |
| | frequency | 4 | 1 | – |
| | a/f switchable | – | – | – |
| | digital | 4 | – | – |
| | CAN | 6 / 14 (opt.) | – | – |
| **Outputs** | digital | 4 | – | – |
| | analog | 2 | 1 | 1 |
| | relais | – | 1 | 1 / 2 |
| **Calcualted measuring values** | number | 6 / 14 (opt.) | – | – |
| | sum / difference | • / • | – | – |
| | performance | • | – | – |
| | dx / dt | • | – | – |
| | free formula definition | • | – | – |
| **ISDS** | | • | – | – |
| **Presentation** | Nº of pres. channels | 0 / 8 / 16 (30[1]) | 1 | 1 |
| | graphically | y = f(t) / y = f(x)[1] | – | – |
| | color | •[1] | – | – |
| | memory presentation | •[1] | – | – |
| **Memory** | scan rate | 0.1 ms / 1 ms | – | – |
| | memory size / places | 256 MB / 200 | – | – |
| | trigger | • | – | – |
| | trigger link | • | – | – |
| | pretrigger | • | – | – |
| | cyclic recording | • | – | – |
| **Operation** | direct | – | • | – |
| | menu | – | – | • |
| | touchscreen | – | – | – |
| | PC operation / online mode | • / • | – | – |
| **Interfaces** | USB | • | – | – |
| | RS 232 | • | – | – |
| | RS 485 | – | – | – |
| **Linearisation** | | • | – | – |
| **Channel filter** | software / hardware filter | • / – | – | – |
| **Printer** | | • | – | – |
| **Battery operation** | | – | – | – |
| **A/D converter** | | 16 bit | 12 bit | 12 bit |

1: via PC

# MultiSystem

**MultiSystem** are high end measuring systems with a complete range of functions for all applications.
With numerous channels for several input signals and measurands and the possibility of internal and external trigger control. You may execute real-time calculations on virtual channels, or display and record sensor signals from a CAN bus.
**MultiSystem** instruments (not MultiSystem 4010) are able to run pre-defined test sequences and to record the results in a fool-proof way. Use the **MultiXtend** extension modules to increase measuring systems to individual applications.

## Unlimited Possibilities

**MultiSystem/MultiControl 8050**

**MultiSystem 5060** *Plus*

**MultiSystem 4010**

Up to ten analog sensors with up to 10,000 values logged per second

up to four sensors with frequency input signal

further sensors and input signals via CAN bus

MultiXtend extension modules for more channels, further input signals or additional functions

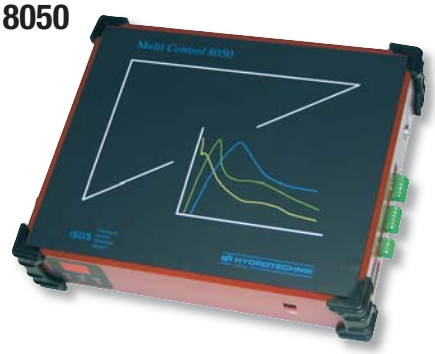
# MultiSystem 8050


This measuring system is incomparable: all values are displayed clearly on the large touchscreen, either numerically or as line diagram. This adds to the unique flexibility by the variety of inputs and outputs.

- **Everything visible:**
  up to 30 channels on the TFT monitor simultaneously
- **Live analysis of measuring data:**
  huge graphic display for perfect line diagrams
- **High end measuring system:**
  HighSpeed inputs and various filter functions
- **Universal use:**
  analog and digital inputs and outputs, many interfaces
- **Outstanding operational concept:**
  touchscreen monitor and logical menu structure

## MultiControl 8050

HYDRO link



If you always have a notebook with you, this version without display will surely meet your needs as a completely equipped measuring box. With identic performance to the MultiSystem 8050 you connect the MultiControl with your PC via USB or Ethernet. The operation is done in an easy and comfortable way with the software package **HYDRO***link* that comes free of charge with the instrument.

## MultiPanel 8050

HYDRO link

The sophisticated measuring electronics of the MultiSystem 8050 is available in a 19“ rack casing to equip test benches and measuring laboratories. Either with 8 or 16 displays you have everything visible. The connection to a PC is done with the software package **HYDRO***link* that is part of the delivery.

# MultiSystem 8050 Technical Data

## Inputs / outputs / channels

| | |
|---|---|
| Analog input channels | 8x standard, 2x HighSpeed (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA • 0 ... 10 V • ± 10 V |
| A/D converter | 16 bit |
| HighSpeed measuring rate | 10,000 values per second |
| Standard measuring rate | 1,000 values per second |
| Error limits | ± 0.1 % FS |
| Frequency input channels | 4x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0.05 Hz ... 20 kHz (w.o.D.) • 0.05 Hz ... 5 kHz (w.D.) |
| Measuring rate | 1 kHz |
| Error limits | ± 0.2 % mv |
| Digital inputs | 4x, 3.5 ... 30 VDC (1x separated galvanically) |
| Measuring rate | 1,000 values per second |
| Current measuring input | ± 2 A DC |
| Voltage measuring input | ± 48 V DC |
| A/D converter | 12 bit |
| Digital output | 4x NPN transistor output |
| max. load | ≤ 30 VDC / 10 mA |
| Reaction time | ≤ 1 ms |
| Analog output | 2x, 0 ... 20 mA (channel 25) • ± 20 mA (channel 26) |
| D/A converter | 12 bit |
| Electrical measuring conn. | 6-pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 6x (option 14x) |
| Calculations | difference, sum, hydraulic power, CAN, ... |
| Free formula input | yes |
| CAN measuring rate | 100 values per second |
| CAN protocols | CANopen, SAE J1939, ... |
| Filter functions | several software filters |

## Data memory

| | |
|---|---|
| Type | CF card 256 MB |
| Measuring series | 200 |
| Values per measuring series | 6,000,000 |
| Recording rate | 0.1 ms ... 999 Min. (settable) |
| Recording time | 1 s ... 999 h (settable) |
| Trigger | 2x (option 6x), linkable (bigger, smaller, rising / falling flange) |
| Pre trigger | 0 / 10 / 20 / ... 100 % |

# MultiSystem 8050 Technical data

## Equipment

| | |
|---|---|
| Electrical meas. connector | M 16 x 0.75, 6 pole (compatible with DIN 45 322 / IEC 60130-9) |
| Interfaces | USB 1.1 device • RS 232 • Centronics • CAN • LVDS |
| Power supply | power pack 24 V DC, 2 A |
| Sensor power supply | 18 VDC, 100 mA |
| CAN / MX power supply | not possible |

## Qualities

| | |
|---|---|
| Casing | steel plates with edge protectors |
| Dimensions | ~ 310 x 254 x 60 mm (L x W x H) |
| Weight | ~ 3,100 g |
| Protection type | IP 40 |
| Operation temperature | 0 ... +40 °C (MS 8050) / 0 ... +60 °C (MC 8050) |
| Allowed humidity | ≤ 80 % r.h. (not condensing) |
| Storage temperature | -20 ... +60 °C |

# MultiSystem 8050 Order data

## Single unit

| Range of delivery | Order number |
|---|---|
| MultiSystem 8050 | 3160-00-65.00 |
| MultiControl 8050 | 3160-00-66.00 |
| MultiPanel 8050 (8 displays) | 3165-11-01.00 |
| MultiPanel 8050 (16 displays) | 3165-11-02.00 |
| • Power pack<br>• USB cord<br>• Data CD<br>• **HYDRO***com* 6 Full, 3 licenses<br>• **HYDRO***link* | |

# MultiSystem 8050 Accessories

## Power supply

| | | |
|---|---|---|
| Power pack (table), 110 ... 240 VAC, 47 ... 63 Hz – 24 V DC, 53 W | | 8812-00-00.27 |
| Car connector cable, 12 ... 24 VDC, length 5.0 m | | 8824-79-05.00 |

## Cables

Measuring cables are contained in the chapter „Accessories“

| | | |
|---|---|---|
| CAN connection cable, D-sub plug (9 pole) – M12 x 1 jack (8 pole), 5.0 m | | 8824-N1-05.00 |
| CAN connection cable, D-sub plug (9 pole) – open cable ends, 1.5 m | | 8824-M6-01.50 |
| **HYDRO***boot* connection cable, 1.5 m | | 8824-F8-01.50 |
| Patrick connection cable<br>D-sub plug (9 pole) – M12 x 1 jack (8 pole)<br>Y distributor and separate power supply required<br>(see Patrick accessories) | 2.5 m | 8824-T3-02.50 |
| | 5.0 m | 8824-T3-05.00 |
| | 10.0 m | 8824-T3-10.00 |
| Trigger cable, MS/MC 8050 – MS/MC 8050, 0.5 m | | 8824-F2-00.50 |
| USB cable, 2.0 m | | 8824-F4-02.00 |

## Others

| | |
|---|---|
| Nylon bag, black | 8875-01-06.00 |
| Transportation case, aluminium, red, with bottom compartment | 3160-00-65.03 |
| Data CD, software and operation instructions manual | 8874-16-00.01 |
| **HYDRO***com* 6, program version Professional, 3 licenses | 8874-19-01.01 |
| **HYDRO***com* 6, program version Full, 3 licenses | 8874-19-01.02 |
| **HYDRO***link*, 1 license | 8874-00-07.01 |
| **HYDRO***gen* / **HYDRO***run*, 1 license | 8874-01-01.55 |

## Calibration and Service

| | |
|---|---|
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.04 |
| Service package Plus | 3199-30-01.08 |
| Service package Professional | 3199-30-02.08 |

# MultiSystem 5060 *Plus*


**The mobile all rounder:** the perfect mobile measuring system with 24 channels, 2 GB data memory and powerful operating software. Use the graphic display to analyse measurements during recording, download measuring data fast and easy to a USB stick.


- **For all measuring tasks:**
  flexible hand held instrument with huge functionality
- **Large display:**
  impressive graphical performance with high resolution
- **Live analysis of measuring data:**
  descriptive line diagrams with zoom function
- **Robust construction:**
  shock-resistant casing with rigid connectors
- **Highest flexibility:**
  24 channels for freely definable measurands

# MultiSystem 5060 *Plus* Technical data

## Inputs, outputs and channels

| | |
|---|---|
| Analog input channels | 4x standard, 2x HighSpeed (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA • 0/1/2 ... 10 V • 0.5 ... 4.5 V • ± 10 V |
| A/D converter | 13 bit |
| Meas. rate HighSpeed | 10,000 values per second |
| Meas. rate standard | 1,000 values per second |
| Error limits | ± 0.15 % FS |
| Frequency input channels | 2x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0.25 Hz ... 20 kHz (w.o.D.) • 0.25 Hz ... 5 kHz (w.D.) |
| Measuring rate | 10 ns |
| Error limits | ± 0.02 % MV |
| Digital input | 1x, galvanically separated, 3.5 ... 30 VDC |
| Measuring rate | 1,000 values per second |
| Digital output | 1x |
| max. load | Ub / 10 mA |
| reaction time | ≤ 1 ms |
| Elektrical meas. connector | 6 pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 14x |
| Calculations | difference, sum, hydraulic power, CAN, ... |
| Free definable formulas | yes |
| CAN measuring rate | 100 values per second |
| CAN protocols | CANopen, SAE J1939, ... |
| Filter functions | Hardware- (low-pass) and several software filters |

## Data memory

| | |
|---|---|
| Type | Micro SD card 2GB |
| Measuring series | 200 |
| Values per measuring series | 2,000,000 |
| Recording rate | 1 ms ... 999 min. (settable) |
| Recording time | 1 s ... 999 h (settable) |
| Trigger | 2x, linkable (bigger, smaller, falling/rising edge) |
| Pretrigger | 0 / 10 / 20 / ... 100 % |

# MultiSystem 5060 *Plus* Technical data

## Equipment

| | |
|---|---|
| Interfaces | USB 2.0 device • USB 2.0 host • RS 232 |
| Battery power supply | NiMH batteries, 14.4 VDC, 2,150 mAh |
| Battery operation | max. 8 h |
| Mains operation power supply | 12 ... 30 VDC |
| Sensor power supply | 13 (battery operation) ... 22 (mains operation) VDC, 100 mA |
| CAN / MX power supply | Vs+ VDC, 180 ... 200 mA |

## Qualities

| | |
|---|---|
| Casing | Plastic PC + ABS + 20GF |
| Dimensions | ~ 270 x 140 x 69 mm (L x W x H) |
| Weight | ~ 1,277 g |
| Protection type | IP 40 |
| Temperature – operation | -10 ... +50 °C @ max. 80 % r.h., not condensing |
| – storage | -20 ... +50 °C |

# MultiSystem 5060 *Plus* Order data

## Single unit

| Range of delivery | Order Nº |
|---|---|
| MultiSystem 5060 Plus<br>• Power pack<br>• USB cable<br>• Data CD<br>• **HYDRO***com* 6 Full, 3 licenses | 3160-00-79.00 |

## Measuring sets

PR 400

TE 100

QT 100

| Pressure measurement | Order Nº |
|---|---|
| **Version C**<br>• All components of the single unit<br>• 2x HySense® PR 400 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 5060C-pp-xx[1]-xx[1]<br>1: see below for measuring range codes |

# MultiSystem 5060 *Plus* Order data

## Measuring sets

| Pressure and temperature measurement | Order Nº |
|---|---|
| **Version C**<br>• All components of the single unit<br>• 2x HySense® PR 400 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 2x Minimess® direct connector 1620<br>• 3x measuring cables standard, 5.0 m<br>• Plastic case, black | 5060C-ppT-xx[1]-xx[1]<br><br>1: see below for measuring range codes |

| Measure pressure, temperature and volume flow rate | Order Nº |
|---|---|
| **Version C**<br>• All components of the single unit<br>• 2x HySense® PR 400 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® QT 100 volume flow rate sensor<br>• 4x measuring cables standard, 5.0 m<br>• Plastic case, black | 5060C-ppTQ-xx[1]-xx[1]-yy[2]<br><br>1: see below for measuring range codes<br>2: see below for measuring range codes |

| Measuring ranges PR 400 | Code | Measuring ranges QT 100 | Code |
|---|---|---|---|
| 0 ... 600 bar \| 0 ... 8,700 psi | 18 | 16 ... 600 l/min \| 4.25 ... 158.5 gpm | 72 |
| 0 ... 400 bar \| 0 ... 5,800 psi | 15 | 9 ... 300 l/min \| 2.35 ... 79.25 gpm | 71 |
| 0 ... 200 bar \| 0 ... 2,900 psi | 10 | 2 ... 75 l/min \| 0.5 ... 19.8 gpm | 70 |
| 0 ... 60 bar \| 0 ... 870 psi | 21 | 1 ... 10 l/min \| 0.26 ... 2.6 gpm | 01 |

Measuring set 5060C-ppTQ with sensors for pressure, temperature and volume flow rate, Minimess® connectors and accessories; the image shows optional components, like additional sensors, Patrick the particle counter and a MultiXtend module.

# MultiSystem 5060 *Plus* Accessories

## Power supply

| | | |
|---|---|---|
| Power pack (plug version), 115 ... 230 VAC | | 8812-20-02.00 |
| Power pack (table version), 115 ... 230 VAC | | 8812-02-01.00 |
| Car connection cable, 12 VDC, 5.00 m | | 8824-64-05.00 |
| Batteries | | 8873-07-01.00 |

## Cables

Measuring cables are contained in the section „Accessories“

| | | |
|---|---|---|
| CAN connection cable, plug – jack M12 x 1 (5 pole), for MultiXtend, 5.0 m | | 8824-R7-05.00 |
| CAN connection cable, plug M12 x 1 (8 pole), open cable ends, 1.5 m | | 8824-R9-01.50 |
| Multimeter connection cable, M12 x 1, 2.0 m | | 8824-R6-02.00 |
| **HYDRO***boot* connection cable, 2.0 m | | 8824-R5-02.00 |
| Patrick connection cable<br>plug – jack M12 x 1 (8 pole)<br>Y distributor required (see Patrick accessories) | 2.5 m | 8824-T2-02.50 |
| | 5.0 m | 8824-T2-05.00 |
| | 10.0 m | 8824-T2-10.00 |
| Patrick connection cable<br>plug – plug M12 x 1 (8 pol),<br>use without Y distributor, power supply from measuring instrument | 2.5 m | 8824-T6-02.50 |
| | 5.0 m | 8824-T6-05.00 |
| | 10.0 m | 8824-T6-10.00 |
| USB cable, USB-A – USB-B, 2.0 m | | 8824-F4-02.00 |

## Others

| | |
|---|---|
| Cap rail mounting set, clip + rail + screws | 8854-00-00.02 |
| Velcro strip mounting set, 5 pieces | 8840-00-00.13 |
| Neck strap set, with fixing | 8854-00-00.01 |
| Data CD, software and operating instructions manual | 8874-16-00.01 |
| Plastic case, black, with compartments for turbine, Patrick, MultiXtend | 8859-02-02.03 |
| Plastic case, red, with foam inlays | 8854-15-00.14K |
| Leather bag (art.), with see-through panel | 8875-01-07.00 |
| **HYDRO***com* 6, program version Professional, 3 licenses | 8874-19-01.01 |
| **HYDRO***com* 6, program version Full, 3 licenses | 8874-19-01.02 |

## Calibration and Service

| | |
|---|---|
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.03 |
| Service package Plus | 3199-30-01.06 |
| Service package Professional | 3199-30-02.06 |

# MultiSystem 4010


**The entry to complexity:** the handy mobile measuring system that has 12 channels and can meet the demands of ambitious measuring technicians. With its professional functions it is suited for complex measuring tasks at small and medium-sized systems, but also for the fast measurement anywhere you are.


- **For all measuring tasks:**
  flexible hand-held device with large functionality
- **Live analysis of measuring data:**
  large graphic display for clear line diagrams
- **Robust construction:**
  shock-resistant casing with rigid connectors
- **Easy operation:**
  one hand operation concept and self explanatory menus
- **Highest flexibility:**
  12 channels and 37 measurands

# MultiSystem 4010 Technical data

## Inputs, outputs and channels

| | |
|---|---|
| Analog input channels | 3x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA • 0/2 ... 10 V |
| A/D converter | 12 bit |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0.2 % FS |
| Frequency input channels | 1x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0,25 Hz ... 20 kHz (w.o.D.) / 0.25 ... 5 kHz (w.D.) |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0.02 % MW |
| Switchable input channels | 1x analog / frequency (for sensors with or without Hydrotechnik ISDS) |
| Qualities | see above |
| Digital input | 1x, separated galvanically |
| Measuring rate | 1,000 values per second |
| Digital output | 1x |
| max. load | Ub / 10 mA |
| Reaction time | ≤ 1 ms |
| Electrical meas. connector | 6 pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 5x |
| Calculations | difference, sum, hydraulic power, CAN (option) |
| CAN measuring rate | 100 values per second |
| CAN protocols | CANopen, SAE J1939, ... |

## Data memory

| | |
|---|---|
| Type | Micro SD card 2GB |
| Measuring series | 100 |
| Values per series | 1,000,000 |
| Recording rate | 1 ms ... 999 Min. (settable) |
| Recording time | 1 s ... 999 h (settable) |
| Trigger | 1x (bigger, smaller, rising/falling edge) |
| Pretrigger | 0 / 10 / 20 / ... 100 % |

## Equipment

| | |
|---|---|
| Interface | USB 2.0 / FS device |
| Battery power supply | NiMH batteries, 14.4 VDC, 1,100 mAh |
| Battery operation time | max. 6 h |
| Mains power supply | 12 ... 30 VDC |
| Sensor power supply | 14 ... 22 VDC, 100 mA |
| CAN / MX power supply | Vs+ VDC, 200 mA |

# MultiSystem 4010 Technical data

## Qualities

| | |
|---|---|
| Casing | Plastic PC + ABS + 20GF |
| Dimensions | ~ 225 x 128 x 63 mm (L x W x H) |
| Weight | ~ 841 g |
| Protection type | IP 40 |
| Temperature – operation | 0 ... +50 °C @ max. 80 % r.h., not condensing |
| – storage | -10 ... +70 °C |

# MultiSystem 4010 Order data

## Single unit

| Range of delivery | Order No |
|---|---|
| MultiSystem 4010 | 3160-00-75.00 |
| MultiSystem 4010, option CAN | 3160-00-75.10 |
| • Power pack<br>• USB cable<br>• Data CD<br>• **HYDRO**com 6 Full, 3 licenses | |

## Measuring sets


PR 100


PR 101


TE 100


QT 100

| Pressure measurement | Order Nº |
|---|---|
| **Version A**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 100 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010A-pp-xx[1]-xx[1]<br>1: see below for measuring range codes |
| **Version B**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 101 pressure sensor<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010B-pp-xx[1]-xx[1]<br>1: see below for measuring range codes |

# MultiSystem 4010 Order data

## Measuring sets

| Pressure and temperature measurement | Order Nº |
|---|---|
| **Version A**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 100 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 2x Minimess® direct connector 1620<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010A-ppT-xx[1]-xx[1]<br>1: see below for measuring range codes |
| **Version B**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 101 Drucksensor<br>• 1x HySense® TE 100 temperature sensor<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010B-ppT-xx[1]-xx[1]<br>1: see below for measuring range codes |

| Measuring of pressure, temperature and volume flow rate | Order Nº |
|---|---|
| **Version A**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 100 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® QT 100 volume flow rate sensor<br>• 4x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010A-ppTQ-xx[1]-xx[1]-yy[2]<br>1: see below for measuring range codes<br>2: see below for measuring range codes |
| **Version B**<br>• All components of the single unit (without option CAN)<br>• 2x HySense® PR 101 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® QT 100 volume flow rate sensor<br>• 4x measuring cable standard, 5.0 m<br>• Plastic case, black | 4010B-ppTQ-xx[1]-xx[1]-yy[2]<br>1: see below for measuring range codes<br>2: see below for measuring range codes |

| Meas. ranges PR 100 / PR 101 | Code | Measuring ranges QT 100 | Code |
|---|---|---|---|
| 0 ... 600 bar \| 0 ... 8,700 psi | 18 | 16 ... 600 l/min \| 4.25 ... 158.5 gpm | 72 |
| 0 ... 400 bar \| 0 ... 5,800 psi | 15 | 9 ... 300 l/min \| 2.35 ... 79.25 gpm | 71 |
| 0 ... 200 bar \| 0 ... 2,900 psi | 10 | 2 ... 75 l/min \| 0.5 ... 19.8 gpm | 70 |
| 0 ... 60 bar \| 0 ... 870 psi | 21 | 1 ... 10 l/min \| 0.26 ... 2.6 gpm | 01 |
| -1 ... +6 bar \| -14 ... +87 psi | 32 | | |

Measuring set 4010A-ppTQ with sensors for pressure, temperature and volume flow rate, Minimess® connectors and accessories; the image shows optional components, like additional sensors, Patrick the particle counter and a MultiXtend module.

# MultiSystem 4010 Accessories

## Power supply

| | | |
|---|---|---|
| Power pack (plug version), 115 ... 230 VAC | | 8812-20-02.00 |
| Power pack (table version), 115 ... 230 VAC | | 8812-01-01.00 |
| Car connection cable, 12 VDC, 5.0 m | | 8824-64-05.00 |
| Batteries | | 8873-08-02.00 |

## Cables

Measuring cables are contained in the chapter „Accessories“

| | | |
|---|---|---|
| CAN connection cable, plug – jack M12 x 1 (5 pole), for MultiXtend, 5.0 m | | 8824-R7-05.00 |
| CAN connection cable, plug M12 x 1 (8 pole), open cable ends, 1.5 m | | 8824-R9-01.50 |
| Multimeter connection cable, M12 x 1, 2.0 m | | 8824-R6-02.00 |
| **HYDRO***boot* connection cable, 2.0 m | | 8824-R5-02.00 |
| Patrick connection cable<br>plug – jack M12 x 1 (8 pole)<br>Y distributor required (see Patrick accessories) | 2.5 m | 8824-T2-02.50 |
| | 5.0 m | 8824-T2-05.00 |
| | 10.0 m | 8824-T2-10.00 |
| Patrick connection cable<br>plug – plug M12 x 1 (8 pole)<br>use without Y distributor<br>power supply by measuring instrument | 2.5 m | 8824-T6-02.50 |
| | 5.0 m | 8824-T6-05.00 |
| | 10.0 m | 8824-T6-10.00 |
| USB cable, USB-A – Micro-USB-B, 2.0 m | | 8824-R4-02.00 |

## Others

| | |
|---|---|
| Cap rail mounting set, clip + rail + screws | 8854-00-00.02 |
| Velcro strip mounting set, 5 pieces | 8840-00-00.13 |
| Neck strap set, with fixing | 8854-00-00.01 |
| Data CD, software and operating instructions manual | 8874-16-00.01 |
| Plastic case, black, with compartments for turbine, Patrick, MultiXtend | 8859-02-02.03 |
| Plastic case, red, with foam inlays | 8854-15-00.14K |
| **HYDRO***com* 6, program version Professional, 3 licenses | 8874-19-01.01 |
| **HYDRO***com* 6, program version Full, 3 licenses | 8874-19-01.02 |

## Calibration and Service

| | |
|---|---|
| Upgrade MultiSystem 4010 with option „CAN“ | 3199-30-03.02 |
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.03 |
| Service package Plus | 3199-30-01.09 |
| Service package Professional | 3199-30-02.09 |

# MultiHandy + MultiBox

**MultiHandy** are robust measuring devices, developed for daily diagnosis at small to medium sized systems. They are easy to operate and very reliable, equipped with two or three measuring inputs and a virtual channel for live calculations. Data download and PC connection via USB are standard, just as long battery performance and ISDS to automatically detect connected sensors are standard also.

**MultiBox** is the name of our measuring boxes for the use with a PC or Laptop. The basic version **MultiBox** 3060 is a measuring box without memory and can be operated without power pack. The **MultiBox** 3061 has an internal memory and due to its robustness it is very well suited for field measurements and tests under difficult environmental conditions. With its Ethernet interface, the **MultiBox** 3065 can be integrated into network architectures and programmed and operated with the **HYDRO***work* supplied with all instruments.

**MultiBox 3060**

**MultiBox 3061**

**MultiBox 3065**

**MultiHandy 3020**

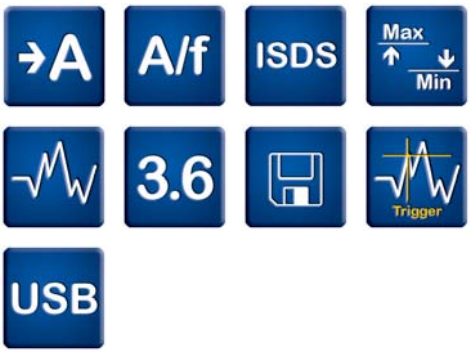
**MultiHandy 2020**

Up to four analog sensors with up to 1,000 values logged per second

One sensor with frequency input signal

MultiXtend extensions modules for more input signals or additional functions

# MultiBox 3060 / 3061 / 3065




Whether as a measuring box connected to a PC or as an independant data logger, highest flexibility and perfect protection against environmental conditions make the **MultiBox** measuring instrument the universal solution for many industrial measuring tasks.

- **Fits perfectly:** three types and six versions
- **Very easy to use:** power supply and data transfer via USB
- **Universal use:** measuring box via PC or an independant data logger
- **Robust construction:** protected acc. to IP 54 in a stable casing (not MB 3065)
- **Complete software package:** remote control, online measuring, data analysis and evaluation
- **Complete system integration:** compatible with all Hydrotechnik measuring products

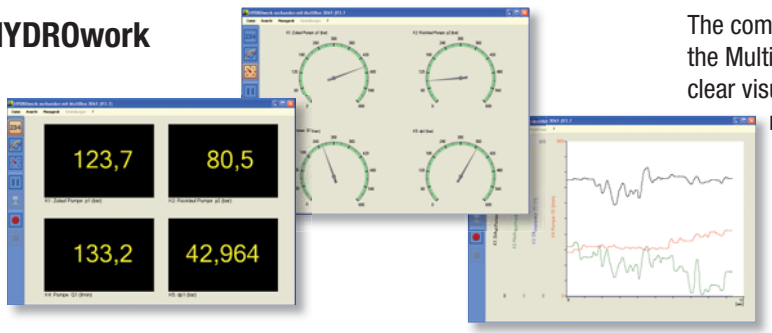
## Versionen

**MultiBox 3060**
with USB interface the indispensable companion of your laptop: fully fledged measuring device with user-friendly software

**MultiBox 3061**
like MultiBox 3060, but with internal data memory and connector for power pack or battery pack: measuring box and data logger in one

**MultiBox 3065**
like MultiBox 3061, but with Ethernet interface for seamless integration into networks and plant controls

## HYDROwork




The comfortable operation software to use all functions of the MultiBox. Easy programming of the device parameters, clear visualisation of the measuring results and fast recording of all data are the most important features.

# MultiBox 3060 / 3061 / 3065 Technical data

## Inputs and channels

| | |
|---|---|
| Analog input channels | 3x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA or 0/2 ... 10 V (due to device version) |
| A/D converter | 12 bit |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0,1 % FS |
| Switchable input channel | 1x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA or 0/2 ... 10 V (due to device version)<br>1.0 Hz ... 5 kHz (w.D.) or 1.0 Hz ... 10 kHz (w.o.D.) |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0.2 % of measured value |
| Elektrical meas. connector | 6 pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 2x |
| Calculations | difference, hydraulic power |

## Data memory

not MultiBox 3060

| | |
|---|---|
| Type | SD-Karte 2 GB |
| Measuring series | 200 |
| Values per series | 36,000,000 (data logger) / 15,000,000 (PC mode) |
| Recording rate | 1 ms ... 1 min. (settable in steps) |
| Recording time | 1 s ... 48 h (settable in steps) |
| Trigger | 1x (option 4x, linkable) |
| Pretrigger | 0 / 10 / 20 / ... 100 % |

## Equipment

| | |
|---|---|
| Interface | USB 2.0 / FS device |
| Power supply | 5.0 VDC (via USB) |
| Mains power supply | 9 ... 30 VDC (option, only for MB 3061 and 3065) |
| Current consumption | < 500 mA (MB 3060) / < 600 mA (MB 3061 and 3065) |
| Sensor current consumption | max. 100 mA (sum) |

## Qualities

| | |
|---|---|
| Casing | Aluminium with protected edges and corners |
| Dimensions | ~ 120 x 124 x 52 mm (L x W x H) |
| Weight | ~ 492 g (MB 3060) / ~ 520 g (MB 3065) |
| Protection type | IP 54 (MB 3060 and 3061) / IP 40 (MB 3065) |
| Temperature – operation | -35 ... +60 °C (MB 3060 and 3061) / 0 ... +50 °C (MB 3065) |
| – storage | -40 ... +70 °C |

# MultiBox 3060 / 3061 / 3065 Order data

## Single unit

| Range of delivery | Order Nº |
|---|---|
| MultiBox 3060, measuring box, input signal mA | 3160-00-00.85 |
| MultiBox 3060, measuring box, input signal V | 3160-00-00.95 |
| MultiBox 3061, USB data logger, input signal mA | 3160-00-00.86 |
| MultiBox 3061, USB data logger, input signal V | 3160-00-00.96 |
| MultiBox 3065, USB/Ethernet data logger, input signal mA | 3160-00-00.87 |
| MultiBox 3065, USB/Ethernet data logger, input signal V | 3160-00-00.97 |
| • USB cable<br>• **HYDRO***work*<br>• **HYDRO***com* 6 Full, 3 licenses | |

## Measuring sets


PR 100


PR 101


TE 100


QT 100

| Pressure measurement | Order Nº |
|---|---|
| **Version A** | |
| • All components of the single unit (input signal mA)<br>• 2x HySense® PR 100 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060A-pp-xx[1]-xx[1]<br>3061A-pp-xx[1]-xx[1]<br>3065A-pp-xx[1]-xx[1]<br>1: see below for measuring range codes |
| **Version B** | |
| • All components of the single unit (input signal mA)<br>• 2x HySense® PR 101 pressure sensor<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060B-pp-xx[1]-xx[1]<br>3061B-pp-xx[1]-xx[1]<br>3065B-pp-xx[1]-xx[1]<br>1: see below for measuring range codes |

| Pressure and temperature measurement | Order No |
|---|---|
| **Version A** | |
| • All components of the single unit (input signal mA)<br>• 2x HySense® PR 100 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 2x Minimess® direct connector 1620<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060A-ppT-xx[1]-xx[1]<br>3061A-ppT-xx[1]-xx[1]<br>3065A-ppT-xx[1]-xx[1]<br>1: see below for measuring range codes |
| **Version B** | |
| • All components of the single unit (input signal mA)<br>• 2x HySense® PR 101 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060B-ppT-xx[1]-xx[1]<br>3061B-ppT-xx[1]-xx[1]<br>3065B-ppT-xx[1]-xx[1]<br>1: see below for measuring range codes |

# MultiBox 3060 / 3061 / 3065 Order data und Zubehör

## Mess-Sets

| Pressure, temperature and volume flow rate measurement | Order Nº |
|---|---|
| **Version A**<br>• All components of the single unit (input signal mA)<br>• 2x HySense® PR 100 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® QT 100 volume flow rate sensor<br>• 4x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060A-<br>3061A-<br>3065A-<br>ppTQ-xx[1]-xx[1]-yy[2]<br>1: see below for measuring range codes<br>2: see below for measuring range codes |
| **Version B**<br>• All components of the single unit (input signal mA)<br>• 2x HySense® PR 101 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® QT 100 volume flow rate sensor<br>• 4x measuring cable standard, 5.0 m<br>• Plastic case, black | 3060B-<br>3061B-<br>3065B-<br>ppTQ-xx[1]-xx[1]-yy[2]<br>1: see below for measuring range codes<br>2: see below for measuring range codes |

| Meas. ranges PR 100 / PR 101 | Code | Measuring ranges QT 100 | Code |
|---|---|---|---|
| 0 ... 600 bar I 0 ... 8,700 psi | 18 | 16 ... 600 l/min I 4.25 ... 158.5 gpm | 72 |
| 0 ... 400 bar I 0 ... 5,800 psi | 15 | 9 ... 300 l/min I 2.35 ... 79.25 gpm | 71 |
| 0 ... 200 bar I 0 ... 2,900 psi | 10 | 2 ... 75 l/min I 0.5 ... 19.8 gpm | 70 |
| 0 ... 60 bar I 0 ... 870 psi | 21 | 1 ... 10 l/min I 0.26 ... 2.6 gpm | 01 |
| -1 ... +6 bar I -14 ... +87 psi | 32 | | |

## Accessories

Measuring cables are contained in the chapter „Accessories“

MultiBox 3065
with battery pack

| | |
|---|---|
| Car connection cable, 12 VDC, 5.0 m | 8824-P5-05.00 |
| Power supply cable 250 V, open cable ends, 5.0 m | 8824-P6-05.00 |
| USB data cable, IP 67, USB-A – Mini-USB-B, 2.0 m | 8824-P4-02.00 |
| Measuring cable, IP 67, M16 x 0.75, 6 pole, 5.0 m | 8824-S9-05.00 |
| Power pack (plug version), IN: 110 ... 240 VAC, 47 ... 63 Hz / OUT: 24 VDC, 625 mA | 8812-00-00.35 |
| Transportation case, black, with turbine compartment | 3160-00-62.09 |
| Battery pack, ~ 2,000 mAh; IN: 24 VDC, 600 mA / OUT: 14.4 VDC | 8873-30-01.00 |
| Data CD, software and operation instructions manual | 8874-16-00.01 |
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.02 |
| Service package Plus | 3199-30-01.04 |
| Service package Professional | 3199-30-02.04 |

# MultiHandy 3020 / 3025


This device has three input channels, a robust casing and the USB interface and covers the basic demands of mobile measuring data collection in a reliable way. Calculations can be executed in real time on an additional channel. This allows to determine, display and record Δp fast and easy.


**MultiHandy 3020**

- **Very flexible:** two analog and one frequency input channel
- **High operation friendliness:** large keys, illuminated display
- **Very suitable for daily use:** robust construction in Aluminium casing
- **Large internal memory:** for est. one million measured values
- **Powerful batteries:** measure the whole day without re-charging
- **Individual:** also available with capacitive keypad


**MultiHandy 3025**

**MultiHandy 3025:** identical measuring device, but with capacitive keypad and newly designed operation area. Eases one-hand operation and accelerates the scrolling of menu parameters.

# MultiHandy 3020 / 3025 Technical data

## Inputs and channels

| | |
|---|---|
| Analog input channels | 2x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA |
| A/D converter | 12 bit |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0.2 % FS |
| Frequency input channels | 1x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0.25 Hz ... 5 kHz |
| Measuring rate | 1 kHz |
| Error limits | ± 0.2 % of measured value |
| Electrical meas. connector | 6 pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 1x |
| Calculations | difference, sum, 1. derivation, hydraulic power |

## Data memory

| | |
|---|---|
| Type | Flash 2 MB |
| Measuring series | 14 |
| Values per series | 1,000,000 (analog) / 333,000 (frequency) |
| Recording rate | 1 ms ... 10 min. (settable) |
| Recording time | 1 s ... 999 h |
| Trigger | 1x |
| Pretrigger | 0 ... 100 % |

## Equipment

| | |
|---|---|
| Display | 2.1“ LCD, illuminated |
| Interface | USB 2.0 / FS device |
| Power supply – mains | Power pack 24 VDC / 340 mA |
| – batteries | NiMH / 14.4 V / 1,100 mAh |
| – battery performance | max. 16 h |
| – sensors | > 13 V (battery operation) / > 18 V (mains operation) |

## Qualities

| | |
|---|---|
| Casing | Aluminium, RAL 3004 |
| Dimensions | ~ 160 x 80 x 40 mm (L x W x H) |
| Weight | ~ 661 g |
| Protection type | IP 40 |
| Temperature – operation | 0 ... 50 °C @ 0 ... 80 % r.h. (not condensing) |
| – storage | -20 ... +50 °C |

# MultiHandy 3020 / 3025 Order data

## Single unit

| Range of delivery | Order Nº |
|---|---|
| MultiHandy 3020, standard keypad<br>MultiHandy 3025, capacitive keypad<br>• Power pack 24 VDC with country-specific adaptors<br>• USB cable<br>• Short operation instructions<br>• Data CD with **HYDRO***com* 6 Base | 3160-00-72.00<br>3160-00-73.00 |

## Measuring sets

PR 100

PR 101

TE 100

QT 100

| Pressure measurement | Order Nº |
|---|---|
| **Version A**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 2x HySense® PR 100 pressure sensor<br>• 2x Minimess® direct connector 1620<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020A-pp-xx[1]-xx[1]<br>3025A-pp-xx[1]-xx[1]<br><br>1: see below for measuring range codes |
| **Version B**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 2x HySense® PR 101 pressure sensor<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020B-pp-xx[1]-xx[1]<br>3025B-pp-xx[1]-xx[1]<br><br>1: see below for measuring range codes |

| Pressure and temperature measurement | Order No |
|---|---|
| **Version A**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 1x HySense® PR 100 pressure sensor<br>• 1x Minimess® direct connector 1620<br>• 1x HySense® TE 100 temperature sensor<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020A-pT-xx[1]<br>3025A-pT-xx[1]<br><br>1: see below for measuring range codes |
| **Version B**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 1x HySense® PR 101 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 2x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020B-pT-xx[1]<br>3025B-pT-xx[1]<br><br>1: see below for measuring range codes |

# MultiHandy 3020 / 3025 Order data and Accessories

## Measuring sets

| Pressure, temperature and volume flow rate measurement | Order No |
|---|---|
| **Version A**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 1x HySense® PR 100 pressure sensor<br>• 1x Minimess® direct connector 1620<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® volume flow rate sensor<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020A-pTQ-xx[1]-yy[2]<br>3025A-pTQ-xx[1]-yy[2]<br><br>1: see below for measuring range codes<br>2: see below for measuring range codes |
| **Version B**<br>• All components of the single unit<br>• **HYDRO***com* 6, program version Full, 3 licenses<br>• 1x HySense® PR 101 pressure sensor<br>• 1x HySense® TE 100 temperature sensor<br>• 1x HySense® volume flow rate sensor<br>• 3x measuring cable standard, 5.0 m<br>• Plastic case, black | 3020B-pTQ-xx[1]-yy[2]<br>3025B-pTQ-xx[1]-yy[2]<br><br>1: see below for measuring range codes<br>2: see below for measuring range codes |

| Meas. ranges PR 100 / PR 101 | Code | Measuring ranges QT 100 | Code |
|---|---|---|---|
| 0 ... 600 bar \| 0 ... 8,700 psi | 18 | 16 ... 600 l/min \| 4.25 ... 158.5 gpm | 72 |
| 0 ... 400 bar \| 0 ... 5,800 psi | 15 | 9 ... 300 l/min \| 2.35 ... 79.25 gpm | 71 |
| 0 ... 200 bar \| 0 ... 2,900 psi | 10 | 2 ... 75 l/min \| 0.5 ... 19.8 gpm | 70 |
| 0 ... 60 bar \| 0 ... 870 psi | 21 | 1 ... 10 l/min \| 0.26 ... 2.6 gpm | 01 |
| -1 ... +6 bar \| -14 ... +87 psi | 32 | | |

## Accessories

Measuring cables are contained in the chapter „Accessories“

| | |
|---|---|
| Power pack (plug version), 110/240 VAC, 50/60 Hz – 24 VDC/630 mA | 8812-20-02.00 |
| Power pack (table version), 100/240 VAC, 50/60 Hz – 24 VDC/630 mA | 8812-02-01.00 |
| Car connection cable, 12 VDC – 24 VDC, 5.0 m | 8824-64-05.00 |
| Batteries, NiMH, 14.4 V, 1,100 mAh | 8873-08-02.00 |
| USB cable, USB-A – USB-B, USB 2.0, 2.0 m | 8824-F4-02.00 |
| Nylon bag, black | 8875-01-02.00 |
| Transportation case, black, with turbine compartment | 3160-00-62.06 |
| Data CD, software and operation instructions manual | 8874-16-00.01 |
| Upgrade **HYDRO***com* 6, Full to Professional, 3 licenses | 8874-19-01.01 |
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.01 |
| Service package Plus | 3199-30-01.02 |
| Service package Professional | 3199-30-02.02 |

# MultiHandy 2020

This measuring device is captivating by its easy user friendly operation. Each measuring set has everything needed for immediate plug and play measurements. Connect sensors – switch device on – read measured values.


- **Fast & easy to measuring success:**
  plug – switch on – measure
- **Less errors:**
  no programming required due to automatic sensor detection
- **PC connection included:**
  data transfer via USB, evaluation software free of charge
- **Large internal memory:**
  for more than 160 hours of data recording
- **Powerful batteries:**
  measure the whole day without re-charging
- **Various functions:**
  even for demanding measuring tasks

# MultiHandy 2020 Technical data

## Inputs and channels

| | |
|---|---|
| Analog input channels | 2x (for sensors with or without Hydrotechnik ISDS) |
| Signals | 0/4 ... 20 mA (sensors without ISDS only 0 ... 20 mA) |
| A/D converter | 12 bit |
| Measuring rate | 1,000 values per second |
| Error limits | ± 0.2 % of measured value |
| Electrical meas. connector | 6 pole jack, compatible to DIN 45 322, IEC 60130-9 |
| Special channels | 1x |
| Calculations | difference |

# MultiHandy 2020 Technical data

## Data memory

| | |
|---|---|
| Type | Flash 128 kB |
| Measuring series | 1 |
| Values per series | max. 60,000 |
| Recording rate | 1 ms / 10 ms / 100 ms / 1 s / 10 s (settable) |
| Recording time | 30 s ... ~ 166 h |

## Equipment

| | |
|---|---|
| Display | 2.5“ LCD, illuminated |
| Software filter | switchable |
| Interface | USB 2.0 UART (virtual COM interface) |
| Power supply – mains | Power pack (plug version) 6 VDC / 850 mA |
| – batteries | NiMH / 2x AA / 2.4 V / 2,500 mAh |
| – battery performance | max. 10 h |
| – sensors | 12 V / 100 mA |

## Qualities

| | |
|---|---|
| Casing | ABS plastic, RAL 3004 |
| Dimensions | ~ 185 x 90 x 46 mm (L x W x H) |
| Weight | ~ 292 g |
| Protection type | IP 40 |
| Temperature – operation | 0 ... 60 °C @ 0 ... 80 % r.h. (not condensing) |
| – storage | -20 ... +70 °C |
| Stability | tested acc. to IEC 60068 |

# MultiHandy 2020 Order data

## Single unit

| Range of delivery | Order Nº |
|---|---|
| • Measuring device<br>• Power pack 6 VDC with country-specific adaptors<br>• USB cable<br>• Short operating instructions manual<br>• **HYDRO***com* 6 Base as download free of charge | 3160-00-69.00 |

# MultiHandy 2020 Order data and accessories

## Measuring set

| Pressure measurement | Order Nº |
|---|---|
| • All components of the single unit<br>• 2x HySense® PR 109 pressure sensor with attached measuring cable, 2.5 m,<br>• 2x Minimess® direct connector 1620<br>• Plastic case, red | 2020D-pp-xx[1]-xx[1]<br><br>1: see below for measuring range codes |

| Available pressure sensors for measuring set MultiHandy 2020 | | | Code |
|---|---|---|---|
| • 0 ... 600 bar | 0 ... 8,700 psi | 0 ... 60 MPa | 18 |
| • 0 ... 400 bar | 0 ... 5,800 psi | 0 ... 40 MPa | 15 |
| • 0 ... 200 bar | 0 ... 2,900 psi | 0 ... 20 MPa | 10 |
| • 0 ... 60 bar | 0 ... 870 psi | 0 ... 6 MPa | 21 |
| • -1 ... +6 bar | -14 ... +87 psi | -0.1 ... +0.6 MPa | 32 |

## Accessories

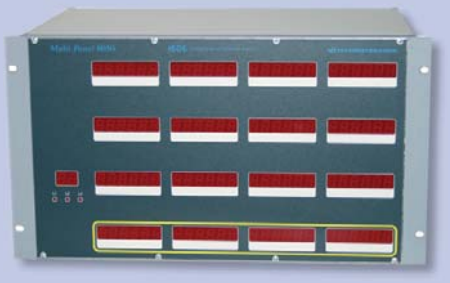
Measuring cables are contained in the chapter „Accessories“

| Compatible sensors (further sensors on request) | Order Nº |
|---|---|
| • Temperature sensor<br>HySense® TE 100, -50 ... +200 °C, 0 ... 20 mA, ISDS | 3973-04-S-01.00S |
| • Temperature – surface / immersion sensor<br>HySense® TE 200, -50 ... +200 °C, 4 ... 20 mA, ISDS | 3170-01-S-03.00<br>3170-01-S-06.00 |
| • Rotational speed sensor<br>HySense® RS 110, 4 ... 20 mA, ISDS | 3130-06-S-01.00 |
| • Volume flow rate – turbine<br>HySense® QT 110, e.g. 9 ... 300 l/min, 0 ... 20 mA, ISDS<br>calibrated for mineral oil with 30 cSt | 31G7-71-S-35.030 |
| • Volume flow rate – turbine<br>HySense® QT 210, e.g. 9 ... 300 l/min, 0 ... 20 mA, ISDS<br>calibrated for watery media | 33G7-78-S-35.V012G |

| | |
|---|---|
| Car connection cable, 12 ... 24 V DC – 6.0 V DC, 4.0 m | 8812-09-04.00 |
| Power pack (plug version), 230 V AC – 6.0 V DC | 8812-00-00.23 |
| USB cord, 2.0 m | 8824-F4-02.00 |
| Upgrade **HYDRO***com* 6, Base to Full, 3 licenses | 8874-19-01.02 |
| Upgrade **HYDRO***com* 6, Base to Professional, 3 licenses | 8874-19-01.01 |
| Calibration, single channels or as measuring chain with sensors (option) | 3199-12-00.11 |
| Service package Basic | 3199-30-00.01 |
| Service package Plus | 3199-30-01.01 |
| Service package Professional | 3199-30-02.01 |

# Stationary Measuring Instruments

Whether as panel mounted device, pressure switch or rack-mount measuring system: you always have the suited solution for test and control rooms, controls and systems for the supervision of plant and systems.



**MultiPanel 8050**

Rack-mounted high end measuring system with 8 or 16 displays; more information on page 8


**SEG 1060**

1-channel measuring device to install in panels, either with analog or digital output or display only

**MultiEPC**

Electronic pressure switch with two switching outputs, also available in a DESINA conforming version

# SEG 1060

This panel-mounted device is perfectly tuned to the Hydrotechnik sensors. It's compact design can be integrated without problems, operated easily with four front panel buttons.


- **Measuring instrument for panel installation:** with switchable input for analog and frequency sensors
- **High usability:** comfortable reading of the large display
- **Large flexibility:** by optional outputs
- **Easy operation:** with four keys and logical menu structure

## Measuring channels

| | |
|---|---|
| Number | 1x (switchable for analog and frequency sensors) |
| Analog signals | 0/4 ... 20 mA, 0 ... 10 V |
| Analog measuring rate | 100 Hz |
| A/D converter | 12 bit |
| Frequency signals | 0 Hz ... 10 kHz |
| Frequency meas. range | 100 Hz (for f ≥ 100 Hz), 1/f + 15 ms (for f < 100 Hz) |
| Error limits | ± 0.2 % FS + 1 digit |

# SEG 1060 Technical data

## Outputs (option)

| | |
|---|---|
| Digital output | 1x |
| Signal | Relais output (opener / closer) |
| max. load | 250 VAC / 10 A |
| Reaction time | ≤ 25 ms (standard signal), ≤ 0.5 Sek. (frequency > 4 Hz) |
| Analog output | 1x |
| Signals | 0/4 ... 20 mA |
| D/A converter | 12 bit |
| Refresh rate | 100 Hz or measuring rate |
| Error limits | ± 0.3 % FS |

# SEG 1060 Technical and order data

## Qualities

| | |
|---|---|
| Electrical meas. connectors | clamp strip |
| Power supply | 230 VAC (type 1), 24 VDC (type 2) |
| Sensor power supply | 24 VDC / 22 mA (type 1), 18 VDC / 35 mA (type 2), separated galvanically |
| Casing | ABS plastic, 115 x 48 x 96 mm (L x W x H) |
| Front frame | 96 x 48 mm (W x H) |
| Weight | 151 g (type 1), 182 g (type 2) |
| Protection type | IP 54 (mounted), IP 65 (on request) |
| Temperature range | -20 ... +50 °C (operation), -30 ... +70 °C (storage) |
| Relative humidity | 0 ... 80 % r.h. (not condensing) |

## Order data

| Range of delivery | Order Nº |
|---|---|
| SEG 1060, 24 V DC | 3192-04-10.00 |
| SEG 1060, 24 V DC, digital- and analog output | 3192-04-11.00 |
| SEG 1060, 230 V AC | 3192-04-20.00 |
| SEG 1060, 230 V AC, digital- and analog output | 3192-04-21.00 |
| • Measuring device<br>• Operating instructions manual<br>• Mounting set | |

## Accessories

| | |
|---|---|
| Sensor cable, jack M16 x 0.75, 5 pole – open cable ends, 2.5 m | 8824-C1-02.50Z |
| Sensor cable, jack M16 x 0.75, 5 pole – open cable ends, 5.0 m | 8824-C1-05.00Z |
| Sensor cable, jack M16 x 0.75, 5 pole – open cable ends, 10.0 m | 8824-C1-10.00Z |

# MultiEPC

This electronic pressure switch is available in standard and DESINA conforming versions with rotatable casing and digital pressure display. Either with one or two independant, programmable limit switches, and one analog output to monitor the pressure curve.

- **Electronic pressure switch:** with two switching outputs
- **Universal use:** five pressure measuring ranges up to 700 bar
- **Measured data downloadable:** output signal 0/4 ... 20 mA
- **Easy operation:** with three keys and logical menu structure

## Technical data

| | |
|---|---|
| Meas. principle / pressure type | piezo-resistive / relative pressure |
| Output signal | 0/4 ... 20 mA (DESINA: 4 ... 20 mA) |
| Measuring connector | M12 x 1, 5 pole (electrical) / ISO 228 – G ¼˝ (mechanical) |
| Error limits | ± 0.5 % v. EW |
| Response time | ≥ 10 ms |

## Outputs

| | |
|---|---|
| Switching outputs | 2 MOSFET high side switch PNP (closer / opener) |
| Switching voltage | Ub – 1.5 V DC |
| Switching / short voltage | max. 0.7 A (pre switch) / 2,4 A (per switch) |

## Qualities

| | |
|---|---|
| Supply voltage | 15 ... 30 VDC (nominal 24 VDC) |
| Current consumption | < 100 mA |
| Materials | GD-ZnAl4Cu1 (casing) / 1.4542 (membrane) |
| Temperature range | -20 ... +85 °C (operation, medium) / -30 ... +100 °C (storage) |
| Orientation | arbitrary |

## Order data

| **Measuring range** (bar) | **Measuring range** (psi) | **Standard** | **DESINA** |
|---|---|---|---|
| 0 ... 25 | 0 ... 360 | 3160-10-40.01 | 3160-11-40.02 |
| 0 ... 100 | 0 ... 1,450 | 3160-10-16.01 | 3160-11-16.02 |
| 0 ... 250 | 0 ... 3,625 | 3160-10-17.01 | 3160-11-17.02 |
| 0 ... 400 | 0 ... 5,800 | 3160-10-15.01 | 3160-11-15.02 |
| 0 ... 700 | 0 ... 10,150 | 3160-10-39.01 | 3160-11-39.02 |

## Accessories

| | |
|---|---|
| Cable, M12 x 1 straight, 5 pole – open cable ends, 5.0 m* | 8824-L0-05.00 |
| Cable, M12 x 1 90°, 5 pole – open cable ends, 5.0 m* | 8824-L1-05.00 |

*: 2.5 m and 10.0 m on request

# MultiXtend Extension Modules

**MultiXtend** is the name of the handy modules that can be used to expand the Hydrotechnik measuring instruments or equip them with additional functions. They may provide further input channels for sensors with analog or frequency output signal, allow the measuring of electrical measurands, or the connection of thermocouples.

## More channels ...


**MultiXtend A**
**MultiXtend f**
**MultiXtend Thermo**

## More signals ...


**MultiXtend Thermo**
**MultiXtend UI**
**MultiXtend NPN**

## More functions ...


**MultiXtend Split**
**MultiXtend Trigger**

# MultiXtend

## Extension Modules

### ... make more of your measuring instruments

## Compatibility

| | | CAN output signal | Usable with ... MultiSystem 8050 | MultiSystem 5060 *Plus* | MultiSystem 4010 | MultiBox 306x | MultiHandy 302x | MultiHandy 2020 |
|---|---|---|---|---|---|---|---|---|
| **MultiXtend** A | 4 analog input channels | ✓ | ✓ | ✓ | ✓ | × | × | × |
| **MultiXtend** f | 4 frequency input channels | ✓ | ✓ | ✓ | ✓ | × | × | × |
| **MultiXtend** f | 1 frequency input channel | ✓ | ✓ | ✓ | ✓ | × | × | × |
| **MultiXtend** Thermo | connect 4 thermocouples | ✓ | ✓ | ✓ | ✓ | × | × | × |
| **MultiXtend** Thermo | connect 1 thermocouple | × | ✓ | ✓ | ✓ | ✓ | ✓ | × |
| **MultiXtend** UI | measure current and voltage | × | ✓ | ✓ | ✓ | ✓ | ✓ | × |
| **MultiXtend** Split | 2 recipients for 1 sensor | × | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **MultiXtend** NPN | connect 1 NPN frequency sensor | × | ✓ | ✓ | ✓ | ✓ | ✓ | × |
| **MultiXtend** Trigger | synchronise up to 4 instruments | × | ✓ | ✓ | ✓ | × | × | × |
| **MultiMeter** | measure electrical measurands | × | ✓ | ✓ | ✓ | × | × | × |

## MultiXtend UI


Measures current or voltage giving an analog output (0 ... 20 mA). The measuring inputs are separated galvanically, a PWM filter can be enabled. Choose one of the two device versions with different measuring ranges.

| | | |
|---|---|---|
| Measuring range voltage | ± 60 V DC | ± 30 V DC |
| Input resistor | 60 kΩ | 10 MΩ |
| Measuring range current | ± 4 A DC | ± 2 A DC |
| Input resistor | 0.05 Ω | 0.1 Ω |
| Supply voltage | 13 ... 30 V DC | |
| Supply current | 40 mA (without signal) | |
| Measuring error | < ± 1 % of end value | |
| Zero value | at output signal 10 mA | |

| | |
|---|---|
| **MultiXtend UI** • measuring ranges ± 30 V DC / ± 2 A DC | 316A-00-00.20 |
| **MultiXtend UI** • measuring ranges ± 60 V DC / ± 4 A DC | 316A-00-00.30 |
| Connection cable for measuring instruments, 5.0 m (measuring cable MKS 03) | 8824-S1-05.00S |
| Replacement fuse 2 A (for 316A-00-00.20) | 8829-01-00.13 |
| Replacement fuse 4 A (for 316A-00-00.30) | 8829-01-00.17 |

# MultiXtend

## Extension Modules

### MultiXtend A

Fig. 1

### MultiXtend f

Fig. 1 / 2

### MultiXtend Thermo

without picture

Fig. 1

Fig. 2

Use these modules to connect additional analog or frequency sensors, or thermocouples. The sensor signals are digitised and transmitted via CAN bus to the measuring instrument.

The MultiXtend A provides four inputs for analog sensors with 0 ... 20 mA or 4 ... 20 mA signal. You may connect up to four frequency sensors to the MultiXtend f, the MultiXtend Thermo is available for four thermocouples of the types Pt 100, J or K.

## Technical data

| | MultiXtend A | MultiXtend Thermo | MultiXtend f |
|---|---|---|---|
| Input signal | 0/4 ... 20 mA | Pt 100 / J / K | 0 ... 500 kHz |
| A/D converter | 16 bit | 16 bit | – |
| Scan rate | 200 Hz | 100 Hz | 1,000 ms * |
| Error limits | 0.01 % v. EW | 0.01 K | ± 1 Hz * |
| Operation / storage temperature | -40 ... +85 °C / -50 ... +140 °C | | |
| Protection type | IP 65 (all cables screwed) | | |
| Casing | Aluminium die casting | | |
| Dimensions | 125 x 57 x 80 mm (L x W x H) | | |

* Gate time measurement: measuring accuracy depends on set gate time; at gate time 1,000 ms (default) the measuring accuracy is ± 1 Hz, at gate time 100 ms it is ± 10 Hz

## Order data

| | |
|---|---|
| **MultiXtend A** • 4x input signal 0 ... 20 mA (with jacks) | 3160-00-00.72A0B |
| **MultiXtend A** • 4x input signal 0 ... 20 mA (with cable screwings) | 3160-00-00.72A0 |
| **MultiXtend A** • 4x input signal 4 ... 20 mA (with jacks) | 3160-00-00.72A4B |
| **MultiXtend A** • 4x input signal 4 ... 20 mA (with cable screwings) | 3160-00-00.72A4 |
| **MultiXtend f** • 4x input signal frequency | 3160-00-00.77 |
| **MultiXtend Thermo** • 4x thermocouple type J (with cable screwings) | 3160-00-00.73J |
| **MultiXtend Thermo** • 4x thermocouple type J, jack „Mini“ | 3160-00-00.73JB |
| **MultiXtend Thermo** • 4x thermocouple type K (with cable screwings) | 3160-00-00.73K |
| **MultiXtend Thermo** • 4x thermocouple type K, jack „Mini“ | 3160-00-00.73KB |
| **MultiXtend Thermo** • 4x thermocouple type Pt 100 | 3160-00-00.73PT |

## Accessories

| | |
|---|---|
| CAN connection cable for MultiSystem 8050, 5.0 m | 8824-N1-05.00 |
| CAN connection cable for MultiSystem 5060, 5.0 m | 8824-M5-05.00 |
| CAN connection cable for MultiSystem 5060 Plus and 4010, 5.0 m | 8824-R7-05.00 |
| CAN power supply, power pack in table version | 8812-00-00.34 |
| CAN Y distributor, M12 x 1 | 8808-50-01.01 |

# MultiXtend

## Extension Modules

### MultiXtend Split


Galvanically separated signal splitter for analog sensors. You may e.g. connect a mounted pressure sensor to a machine display and also connect to a hand held measuring device at the same time.

| | |
|---|---|
| Input signal | 0/4 ... 20 mA |
| Supply voltage | 12 ... 30 V DC |
| Current consumption at OUT 2 | 30 mA (without signal) |
| Linearity error | ± 0.3 % FS (at 23 °C, loop resistor 10 Ω) |
| Warm-up time | 5 min. |
| Operation / storage temperature | -20 ... +85 °C / -40 ... +125 °C |
| Dimensions | 120 x 84 x 44.5 mm (L x W x H) |

| | |
|---|---|
| **MultiXtend Split** | 316A-00-00.40 |
| Connection cable for measuring instruments, 5.0 m (measuring cable MKS 03) | 8824-S1-05.00S |

### MultiXtend Trigger


Box to distribute a trigger signal to up to four measuring systems. This allows to run synchronised recordings on up to 96 channels that can be combined later on a PC using **HYDRO***com*.

| | |
|---|---|
| Input signal | Hydrotechnik-specific trigger signal |
| Supply voltage | not required |
| Protection type | IP 40 |
| Operation / storage temperature | -40 ... +85 °C |
| Dimensions | 120 x 75 x 44.5 mm (L x W x H) |

| | |
|---|---|
| **MultiXtend Trigger** | 316A-00-00.50 |
| Trigger cable for connection to measuring systems, 0.5 m | 8824-F2-00.50 |

# MultiXtend

## Extension Modules

### MultiXtend Thermo


Box to connect a thermocouple of the types J or K to an analog input of your measuring instrument.

| | |
|---|---|
| Input signal | thermocouple type J or K |
| Supply voltage | 7 ... 30 V DC |
| Current consumption | 20 mA (without signal) |
| Linearity error | ± 0.1 % FS (at 23 °C, loop resistor 10 Ω) |
| Operation / storage temperature | -40 ... +85 °C |
| Dimensions | 120 x 82 x 44.5 mm (L x W x H) |

| | |
|---|---|
| **MultiXtend Thermo**, type J | 316A-00-00.70 |
| **MultiXtend Thermo**, type K | 316A-00-00.75 |
| Connection cable for measuring instruments, 5.0 m (measuring cable MK 01) | 8824-S1-05.00S |

### MultiXtend f


Box to connect a frequency sensor to a measuring instrument. The sensor signal is digitised and transmitted via CAN bus. May also be used to feed the signal into a standard CAN bus.

| | |
|---|---|
| Input signal | 10 Hz ... 4 kHz |
| Scan rate | 50 Hz |
| Error limits | ± 0.1 % of final value |
| Operation / storage temperature | -40 ... +85 °C |
| Dimensions | 120 x 82 x 44.5 mm (L x W x H) |

| | |
|---|---|
| **MultiXtend f** | 316A-00-00.60 |
| CAN connection cable for MultiSystem 8050, 5.0 m | 8824-N1-05.00 |
| CAN connection cable for MultiSystem 5060 Plus and 4010, 5.0 m | 8824-R7-05.00 |
| CAN power supply, power pack in table version | 8812-00-00.34 |
| CAN Y distributor, M12 x 1 | 8808-50-01.01 |
| CAN terminal resistor 120 Ω | 8872-02-01.01 |

# MultiXtend

## Extension modules

### MultiXtend NPN


Converts the NPN output signal of a frequency sensor into a PNP signal that can be fed into Hydrotechnik measuring instruments.

| | |
|---|---|
| Input signal | NPN frequency signal |
| Supply voltage | 14 ... 30 V DC |
| Current consumption | 6 mA (without sensor) |
| NPN feed voltage / current | 10 ... 12 VDC / 2 ... 50 mA |
| Operation / storage temperature | -20 ... +85 °C / -30 ... +90 °C |
| Dimensions | 120 x 82 x 44.5 mm (L x W x H) |

| | |
|---|---|
| **MultiXtend NPN** | 316A-00-00.80 |
| Connection cable to measuring instruments, 5.0 m (measuring cable MK 01) | 8824-S1-05.00S |

# MultiMeter

- ✓ Measure electrical measurands
- ✓ Data transfer to RS 232 interface
- ✓ Only suited for MultiSystem 5060 Plus and MultiSystem 4010
- ✓ Technical data on request

| | |
|---|---|
| **MultiMeter Voltcraft**, type VC 920 (with connection cable to MultiSystem) | 8877-00-04.00 |
| **MultiMeter Voltcraft**, type VC 940 (with connection cable to MultiSystem) | 8877-00-05.00 |
| **MultiMeter Voltcraft**, type VC 960 (with connection cable to MultiSystem) | 8877-00-06.00 |

# MultiXtend

## Mounting Systems

The cap rail system is ideal to mount MultiXtend extension modules on the instruments MultiSystem 5060 Plus and MultiSystem 4010. Also suited for DIN rail installation.

✓ Fix cap rail and clip

✓ Mount MultiXtend at the rearside of the measuring instrument ...

✓ ... or install it in a switchboard cabinet

| | |
|---|---|
| Mounting set: cap rail, clip, screws | 8854-00-00.02 |
| Velcro tape mounting set: 5 pieces | 8840-00-00.13 |

Use our velcro tape mounting set for fast and firm installation of MultiXtend on measuring systems or other objects.

# HySense® Sensors

## Pressure sensors

PR

PR 100

Robust sensor, especially for mobile use; million-fold proven

PR 101

Version with direct Minimess® connector for a quicker coupling


PR 400

Fast sensor for demanding measuring tasks (up to 10 kHz)

PR 109

Sensor with measuring cable for the MultiHandy 2020

**Used in** Measuring Set A | Measuring Set B | Measuring Set C | Measuring Set D

## Temperature sensors

TE TP

TE 100

Robust sensor, especially for mobile use

TE 200

Hand sensor with different measuring tips

TP 180

Combined sensor for pressure + temperature

**Used in** Meas. Set A / B / C

## Volume flow rate sensors

QT QG

QT 1xx

Proven measuring turbine for mineral oils, bi-directional measuring possible

QT 2xx

Proven measuring turbine for watery media, bi-directional measuring possible

QG 1xx

Gear flow meter for a broad viscosity range

**Used in** Meas. Set A / B / C

## Further sensors

QL QO RS

QL

Load valves to determine the characteristic curves of pumps

QO

Oval wheel counter for small volume flow rates

RS

Rotational speed sensors

More sensors are contained in our sensor catalog

# HySense® PR 100 • PR 101

Robust and million-fold proven sensor, especially for mobile use. With short response time and available for many pressure ranges. PR 101 with attached direct connector.

## Technical data

| | PR 100 | PR 101 |
|---|---|---|
| Meas. principle / pressure type | piezo-resistive / relative pressure | |
| Output signal | 0 ... 20 mA | |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) | |
| Mechanical measuring connector | ISO 228 – G ¼″ | Minimess® direct connector 1620 |
| Protection type | IP 67 (with screwed plug) | |
| Materials | High-grade steel (casing and membrane) | |
| Dimensions (L x W) | 67 x 22 mm | 81 x 25 mm |
| Weight | ~ 85 g | ~ 110 g |

## Operating limits

| | |
|---|---|
| Over-load / burst pressure | 1.5-times nominal pressure / 3-times nominal pressure |
| Supply voltage | 10 ... 30 VDC |
| Current consumption | 6.5 mA |
| Response time | ≤ 1 ms (10 ... 90 %) |
| Error limites | ≤ ± 0,2 % (linearised) |
| Temperature ranges | -40 ... +100 °C (operation) / -40 ... +130 °C (medium, storage) |

## Order data PR 100

| Measuring range (bar) | Measuring range (psi) | Order Nº |
|---|---|---|
| -1 ... +6 bar | -14 ... +87 | 3403-32-S-E5.33 |
| 0 ... 60 | 0 ... 870 | 3403-21-S-E5.33 |
| 0 ... 200 | 0 ... 2,900 | 3403-10-S-E5.33 |
| 0 ... 400 | 0 ... 5,800 | 3403-15-S-E5.33 |
| 0 ... 600 | 0 ... 8,700 | 3403-18-S-E5.33 |

## Order data PR 101

| Measuring range (bar) | Measuring range (psi) | Order Nº |
|---|---|---|
| -1 ... +6 bar | -14 ... +87 | 34W3-32-S-E5.33 |
| 0 ... 60 | 0 ... 870 | 34W3-21-S-E5.33 |
| 0 ... 250 | 0 ... 3.625 | 34W3-17-S-E5.33 |
| 0 ... 400 | 0 ... 5.800 | 34W3-15-S-E5.33 |
| 0 ... 600 | 0 ... 8.700 | 34W3-18-S-E5.33 |

## Accessories PR 100

| | |
|---|---|
| Minimess® direct connector straight, ISO 228 – G ¼″ int., screw series 1620 | 2103-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ int., screw series 1620 | 2146-13-05.00N |
| Minimess® direct connector straight, ISO 228 – G ¼″ int., screw series 1215 | 2101-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ int., screw series 1215 | 2146-04-02.00N |

# HySense® PR 109

Adapted version of the PR 100 for the unique use with the measuring device MultiHandy 2020. With ISDS and attached measuring cable for easiest operation.

## Technical data

| | PR 109 |
|---|---|
| Meas. principle / pressure type | Piezo-resistive / relative pressure |
| Output signal | 4 ... 20 mA |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug), at measuring cable 5.0 m |
| Mechanical measuring connector | ISO 228 – G ¼˝ |
| Protection type | IP 67 (with screwed plug) |
| Materials | high-grade steel (casing and membrane) |
| Dimensions (L x W) | 59 x 22 mm (without cable) |
| Weight | ~ 85 g |

## Operating limits

| | |
|---|---|
| Overload / burst pressure | 1.5-times nominal pressure / 3-times nominal pressure |
| Supply voltage | 10 ... 30 VDC |
| Current consumption | 6.5 mA |
| Response time | ≤ 1 ms (10 ... 90 %) |
| Error limits | ≤ ± 0.2 % (linearised) |
| Temperature ranges | -40 ... +100 °C (operation) / -40 ... +130 °C (medium, storage) |

## Order data

| Measuring range (bar) | Measuring range (psi) | Order Nº |
|---|---|---|
| -1 ... +6 bar | -14 ... +87 | 3403-32-S-N4.37 |
| 0 ... 60 | 0 ... 870 | 3403-21-S-N4.37 |
| 0 ... 200 | 0 ... 2,900 | 3403-10-S-N4.37 |
| 0 ... 400 | 0 ... 5,800 | 3403-15-S-N4.37 |
| 0 ... 600 | 0 ... 8,700 | 3403-18-S-N4.37 |

## Accessories

| | |
|---|---|
| Minimess® direct connector straight, ISO 228 – G ¼˝ int., screw series 1620 | 2103-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼˝ int., screw series 1620 | 2146-13-05.00N |
| Minimess® direct connector straight, ISO 228 – G ¼˝ int., screw series 1215 | 2101-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼˝ int., screw series 1215 | 2146-04-02.00N |

# HySense® PR 300

Fast, highly precise pressure sensor to measure pressure peaks. Characterised by good noise qualities and very short warm-up time.

## Technical data

| | PR 300 |
|---|---|
| Meas. principle / pressure type | piezo-resistive / relative pressure |
| Output signal | 0 ... 20 mA |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | ISO 228 – G ¼″ internal thread |
| Protection type | IP 40 (with screwed plug) |
| Materials | 1.4104, 1.4301 (casing) / 1.4435 (membrane) |
| Dimensions (L x W x H) | 30 x 30 x 100 mm |
| Weight | ~ 120 g |

## Operating limits

| | |
|---|---|
| Overload / burst pressure | 1.5-times nominal pressure / 2.5-times nominal pressure |
| Supply voltage | 6,5 ... 30 VDC |
| Current consumption | < 10 mA |
| Response time | 1 ms (0 ... 98 %) |
| Error limits | ≤ ± 0,2 % (linearised) |
| Temperature ranges | -20 ... +80 °C (operation, medium) / -20 ... +85 °C (storage) |

## Order data

| **Measuring range** (bar) | **Measuring range** (psi) | **Order Nº** |
|---|---|---|
| -1 ... 6 | -14 ... +87 | 3403-32-S-71.33A |

## Accessories

| | |
|---|---|
| Minimess® direct connector straight, ISO 228 – G ¼″ ext., screw series 1620 | 2103-07-41.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ ext., screw series 1620 | 2146-54-09.40N |
| Minimess® direct connector straight, ISO 228 – G ¼″ ext., screw series 1215 | 2101-07-41.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ ext., screw series 1215 | 2146-54-19.20N |

# HySense® PR 400

Fast pressure sensor for demanding measuring tasks with color codes to avoid mixing up. Used in the measuring sets version C.

## Technical data

| | PR 400 |
|---|---|
| Meas. princile / pressure type | piezo-resistive / relative pressure |
| Output signal | 4 ... 20 mA |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | ISO 228 – G ¼″ |
| Protection type | IP 65 (with screwed plug) |
| Materials | 1.4104, 1.4301 (casing) / 1.4435 (membrane) |
| Dimensions (L x W) | 98 x 22 mm |
| Weight | ~ 120 g |

## Operating limits

| | |
|---|---|
| Overload / burst pressure | 1.5-times nominal pressure / 2.5-times nominal pressure |
| Supply voltage | 6,5 ... 30 VDC |
| Current consumption | < 4 mA |
| Response time | none |
| Error limits | ≤ ± 0,2 % (linearised) |
| Temperature ranges | -20 ... +80 °C (operation, medium) / -20 ... +85 °C (storage) |

## Order data

| | Measuring range (bar) | Measuring range (psi) | Order Nº |
|---|---|---|---|
| | 0 ... 60 | 0 ... 870 | 34P3-21-S-01.37A2 |
| | 0 ... 200 | 0 ... 2,900 | 34P3-10-S-01.37A2 |
| | 0 ... 400 | 0 ... 5,800 | 34P3-15-S-01.37A2 |
| | 0 ... 600 | 0 ... 8,700 | 34P3-18-S-01.37A2 |

## Accessories

| | |
|---|---|
| Minimess® direct connector straight, ISO 228 – G ¼″ int., screw series 1620 | 2103-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ int., screw series 1620 | 2146-13-05.00N |
| Minimess® direct connector straight, ISO 228 – G ¼″ int., screw series 1215 | 2101-07-18.62N |
| Minimess® direct connector 90°, ISO 228 – G ¼″ int., screw series 1215 | 2146-04-02.00N |

## Color codes

0 ... 60 bar | 0 ... 200 bar | 0 ... 400 bar | 0 ... 600 bar

Definite assignment of strong colors to the different pressure ranges. A mixing up and potential destruction of the sensor are avoided.

# HySense® TE 100

Reliable sensor that measures directly in the medium. With attached direct connector it can be screwed on a Minimess® p/T measuring point. With ISDS ideal for mobile use.

## Technical data

| | |
|---|---|
| Measuring principle | Pt 100 (platinum measuring resistor acc. to DIN 43760, class B) |
| Output signal | 0 ... 20 mA |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | Minimess® 1620 p/T |
| Protection type | IP 64 (with screwed plug) |
| Materials | 1.4104 (casing) |
| Dimensions (L x W) | 132.5 x 30 mm |
| Weight | ~ 230 g |

## Operating limits

| | |
|---|---|
| Supply voltage | 10 ... 30 VDC |
| Error limits | ≤ ± 1.0 % |
| Temperature ranges | -20 ... +80 °C (operation) / -20 ... +85 °C (storage) |
| Medium temperature | -50 ... +200 °C |

## Order data & accessories

| | |
|---|---|
| HySense® TE 100, measuring range -50 ... +200 °C, ISDS | 3973-04-S-01.00 |
| Minimess® 1620 p/T measuring point, ISO 228 – G ¼", sealing NBR | 2149-04-15.13N |
| Minimess® 1620 p/T measuring point, ISO 228 – G ¼", sealing FKM | 2149-04-15.53N |
| Minimess® 1620 p/T measuring point, M10 x 1, sealing NBR | 2149-04-19.13N |
| Minimess® 1620 p/T measuring point, M10 x 1, sealing FKM | 2149-04-19.53N |

# HySense® TE 200

Hand sensor to measure the temperature of fluids or surfaces. With ISDS ideal for mobile use.

## Technical data

| | |
|---|---|
| Measuring principle | Pt 100 (platinum measuring resistor acc. to DIN 43760, class B) |
| Output signal | 4 ... 20 mA |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) at helix cable (1.2 m) |
| Mechanical measuring connector | sensor tip or plate |
| Protection type | IP 40 |
| Materials | 1.451 (sensor tip, 150 mm)) |
| Weight | ~ 207 g |

## Operating limits

| | |
|---|---|
| Supply voltage | 12 ... 30 VDC (current consumption 4 mA) |
| Error limits | ≤ ± 1.0 % (of final value) |
| Temperature ranges | -20 ... +85 °C (operation, storage) |
| Medium temperature | corr. to measuring range |

## Order data

| | | |
|---|---|---|
|  | Sensor plate, measuring range -50 ... +200 °C | 3170-01-S-03.00 |
| | Sensor plate, measuring range -50 ... +400 °C | 3170-01-S-07.00 |
|  | Sensor tip, measuring range -50 ... +200 °C | 3170-02-S-06.00 |
| | Sensor tip, measuring range -50 ... +400 °C | 3170-02-S-08.00 |

# HySense® TP 180

Dual sensor for the simultaneous measuring of pressure and temperature at one Minimess® p/T measuring point. Measures directly in the medium that makes the sensor very accurate.

## Technical data

| | Pressure sensor | Temperature sensor |
|---|---|---|
| Measuring principle | piezo-resistive (relative pressure) | Pt 100 (platinum measuring resistor acc. to DIN 43760, class B) |
| Output signal | 4 ... 20 mA | |
| Electrical measuring connector | M16 x 0.75, 8 pole (plug) | |
| Mechanical measuring connector | Minimess® 1620 p/T | |
| Protection type | IP 40 (with screwed plug) | |
| Materials | 1.4104 (casing) / 1.4435 (membrane) | |
| Dimensions (L x W) | 182 x 28 mm | |
| Weight | ~ 255 g | |

## Operating limits

| | Pressure sensor | Temperature sensor |
|---|---|---|
| Overload / burst pressure | 1.5-times / 2.5-times nominal pressure | |
| Supply voltage | 10 ... 30 VDC (current consumption 4 mA) | |
| Response time | ≥ 1 ms | |
| Error limits | ± 0.5 % (of final value) | ± 1.0 % (of final value) |
| Temperature ranges | -20 ... +80 °C (operation) / -20 ... +85 °C (storage) | |
| Medium temperature | -50 ... +200 °C | |

## Order data & Accessories

| | |
|---|---|
| HySense® TP 180, measuring rangee 0 ... 60 bar bzw. -50 ... +200 °C | 3763-04-34.00 |
| HySense® TP 180, measuring rangee 0 ... 600 bar bzw. -50 ... +200 °C | 3403-18-71.33A |
| Measuring cable (separator cable), 8pole jack to 2x 5pole plug, 2.5 m | 8824-D6-02.50 |
| Measuring cable (separator cable), 8pole jack to 2x 5pole plug, 5.0 m | 8824-D6-05.00 |
| Minimess® 1620 p/T measuring point, ISO 228 – G ¼″, sealing NBR | 2149-04-15.13N |
| Minimess® 1620 p/T measuring point, ISO 228 – G ¼″, sealing FKM | 2149-04-15.53N |
| Minimess® 1620 p/T measuring point, M10 x 1, sealing NBR | 2149-04-19.13N |
| Minimess® 1620 p/T measuring point, M10 x 1, sealing FKM | 2149-04-19.53N |

# HySense® QT 100

Thousand-fold proven measuring turbine, either with analog or frequency output signal. Bi-directional flow rate measurement is possible, standard calibration viscosity is 30 cSt (mineral oils).

## Technical data

| | |
|---|---|
| Measuring principle | flow (turbine) |
| Calibration viscosity | 30 cSt |
| Output signal | frequency (QT 100) / 4 ... 20 mA (QT 110) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | acc. to measuring range |
| Protection type | IP 67 (QT 100) / IP 54 (QT 110) |
| Materials | 3.4365 (casing) / FKM (sealings) |
| Turbine wheel material | 1.4122 (measuring range 1 ... 10 l/min) / 1.0718 (other measuring ranges) |
| Weight | acc. to measuring range (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | 12 ... 15 mA (QT 100) / 24 ... 31 mA (QT 110) |
| Response time | none (QT 100) / 250 ms (QT 110) |
| Error limits | acc. to version and measuring range (see order data) |
| Temperature ranges | -20 ... +85 °C (operation, storage) / ≤ 120 °C (medium) |

## Order data

| Output signal | Measuring range | Viscosity range | Mechanical measuring connector | Max. working pressure | | Error limits | Weight | Order Nº |
|---|---|---|---|---|---|---|---|---|
| | l/min | cSt | | bar | PSI | linearised | g | |
| **QT 100** frequency (square wave) | 1.0 ... 10 | 1 ... 30 | ISO 228-G¼″ | 420 | 6,000 | ± 0.5 % of final value | 630 | 31V7-01-S-35.030 |
| | 2.0 ... 75 | 1 ... 100 | ISO 228-G¾″ | 420 | 6,000 | | 785 | 31V7-70-S-35.030 |
| | 9.0 ... 300 | 1 ... 100 | ISO 228-G1″ | 420 | 6,000 | | 1,125 | 31V7-71-S-35.030 |
| | 16 ... 600 | 1 ... 100 | ISO 228-G1¼″ | 350 | 5,000 | | 1,380 | 31V7-72-S-35.030 |
| **QT 110** analog (4 ... 20 mA) | 1.0 ... 10 | 1 ... 30 | ISO 228-G¼″ | 420 | 6,000 | ± 0.7 % of final value | 740 | 31G7-01-S-35.030 |
| | 2.0 ... 75 | 1 ... 100 | ISO 228-G¾″ | 420 | 6,000 | | 895 | 31G7-70-S-35.030 |
| | 9.0 ... 300 | 1 ... 100 | ISO 228-G1″ | 420 | 6,000 | | 1,235 | 31G7-71-S-35.030 |
| | 16 ... 600 | 1 ... 100 | ISO 228-G1¼″ | 350 | 5,000 | | 1,490 | 31G7-72-S-35.030 |

# HySense® QT 200

Thousand-fold proven measuring turbine, either with frequency or analog output signal. Bi-directional volume flow rate measurement possible, developed for water and watery media.

## Technical data

| | |
|---|---|
| Measuring principle | flow (turbine) |
| Calibration viscosity | 2.5 cSt (with oil, 1 cSt on request) |
| Output signal | frequency (QT 200) / 4 ... 20 mA (QT 210) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | acc. to measuring range (see order data) |
| Protection type | IP 67 (QT 200) / IP 54 (QT 210) |
| Materials | 1.4305 (casing) / FKM (sealings) |
| Turbine wheel material | 1.4122 (measuring range 1 ... 10 l/min) / 1.0718 (other measuring ranges) |
| Weight | acc. to measuring range (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | 12 ... 15 mA (QT 200) / 24 ... 31 mA (QT 210) |
| Response time | none (QT 200) / 250 ms (QT 210) |
| Error limits | acc. to version and measuring range (see order data) |
| Temperature ranges | -20 ... +85 °C (operation, storage) / ≤ 120 °C (medium) |

## Order data

| Output signal | Measuring range | Viscosity range | Mechanical measuring connector | Max. working pressure | | Error limits | Weight | Order Nº |
|---|---|---|---|---|---|---|---|---|
| | l/min | cSt | | bar | PSI | linearised | g | |
| **QT 200** frequency (square wave) | 1.0 ... 10 | 1 ... 30 | ISO 228-G¼″ | 420 | 6,000 | ± 0.5 % of final value | 690 | 33V7-01-S-35.V012 |
| | 5.0 ... 100 | 1 ... 10 | ISO 228-G¾″ | 420 | 6,000 | | 1,930 | 33V7-77-S-35.V012G |
| | 15 ... 300 | 1 ... 10 | ISO 228-G1¼″ | 420 | 6,000 | | 3,300 | 33V7-78-S-35.V012G |
| | 25 ... 600 | 1 ... 30 | ISO 228-G1½″ | 350 | 5,000 | | 4,035 | 33V7-79-S-35.V012G |
| **QT 210** analog (4 ... 20 mA) | 1.0 ... 10 | 1 ... 30 | ISO 228-G¼″ | 420 | 6,000 | ± 0.7 % of final value | 800 | 33G7-01-S-35.V012 |
| | 5.0 ... 100 | 1 ... 10 | ISO 228-G¾″ | 420 | 6,000 | | 2,040 | 33G7-77-S-35.V012G |
| | 15 ... 300 | 1 ... 10 | ISO 228-G1¼″ | 420 | 6,000 | | 3,410 | 33G7-78-S-35.V012G |
| | 25 ... 600 | 1 ... 30 | ISO 228-G1½″ | 350 | 5,000 | | 4,145 | 33G7-79-S-35.V012G |

# HySense® QG 100

Positive displacement gear flow meter. Covers a broad viscosity range and is available with frequency or analog output signal.

## Technical data

| | |
|---|---|
| Measuring principle | replacement (GFM) |
| Viscosity range | 5 ... 500 cSt (possible range) / 30 cSt (standard calibration) |
| Output signal | frequency (QG 100) / 4 ... 20 mA (QG 110) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | acc. to measuring range (see order data) |
| Protection type | IP 67 |
| Materials | 1.4305, 0.7060 (casing) / FKM (sealings) |
| Gear wheel material | 1.7131 |
| Weight | acc. to measuring range (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | 15 mA (QG 100) / 24 ... 31 mA (QG 110) |
| Response time | none (QG 100) / 2.5 sec. (QG 110) |
| Error limits | acc. to version and measuring range (see order data) |
| Temperature ranges | -20 ... +80 °C (operation) / -20 ... +85 °C (storage) / -20 ... +120 °C (medium) |

## Order data

| Output signal | Measuring range | Geometric gear volume | Mechanical measuring connector | Max. working pressure | | Error limite | Weight | Order Nº |
|---|---|---|---|---|---|---|---|---|
| | l/min | cm³ | | bar | PSI | linearised | g | |
| **QG 100** frequency (square wave) | 0.005 ... 1.0 | ~ 0.021 | ISO 228-G¼″ | 420 | 6,000 | ± 0.5 % of MV | 1,600 | 3143-01-S-35.030 |
| | 0.05 ... 5.0 | ~ 0.191 | ISO 228-G¼″ | 630 | 9,000 | ± 0.5 % of MV | 3,000 | 3143-02-S-35.030 |
| | 0.2 ... 30 | ~ 0.609 | ISO 228-G⅜″ | 630 | 9,000 | ± 0.5 % of MV | 4,075 | 3143-03-S-35.030 |
| | 0.7 ... 70 | ~ 2.222 | ISO 228-G¾″ | 420 | 6,000 | ± 0.4 % of MV | 9,000 | 3143-04-S-35.030 |
| | 3.0 ... 300 | ~ 8.750 | SAE flange 1¼″ | 420 | 6,000 | ± 0.5 % of MV | 32,330 | 3143-05-S-35.030 |
| **QG 110** analog (4 ... 20 mA, with f/I converter) | 0.005 ... 1.0 | ~ 0.021 | ISO 228-G¼″ | 420 | 6,000 | ± 0.5 % of MV | 1,600 | 3185-01-S-35.030 |
| | 0.05 ... 5.0 | ~ 0.191 | ISO 228-G¼″ | 630 | 9,000 | ± 0.7 % of MV | 3,110 | 3185-02-S-35.030 |
| | 0.2 ... 30 | ~ 0.609 | ISO 228-G⅜″ | 630 | 9,000 | ± 0.7 % of MV | 4,185 | 3185-03-S-35.030 |
| | 0.7 ... 70 | ~ 2.222 | ISO 228-G¾″ | 420 | 6,000 | ± 0.6 % of MV | 9,110 | 3185-04-S-35.030 |
| | 3.0 ... 300 | ~ 8.750 | SAE flange 1¼″ | 420 | 6,000 | ± 0.7 % of MV | 32,440 | 3185-05-S-35.030 |

# HySense® QO

Oval wheel counter to measure small volume flow rates. They are robust, simple and easy-to-use and cover a broad viscosity range. Due to a modular construction they are suited for a large variety of media.

## Technical data

| | |
|---|---|
| Measuring principle | replacement (oval wheels) |
| Viscosity range | acc. to model (see order data) |
| Output signal | frequency (PNP) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | acc. to measuring range (see order data) |
| Protection type | IP 67 (QO 100, QO 200) / IP 50 (QO 300) |
| Materials | Aluminium, PPS (QO 100, QO 200) / Aluminium (QO 300) |
| Sealing material | FKM (QO 100) / NBR (QO 200) / Compound 19457 (QO 300) |
| Weight | acc. to model (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | horizontal (oval wheel axes must stand vertically) |
| Supply voltage | 10 ... 30 VDC |
| Current consumption | ≤ 200 mA |
| Error limits | ≤ ± 0.5 % (QO 100, QO 200) / ± 0.3 ... ± 1.0 % (QO 300) |
| Medium temperature range | -10 ... +70 °C (QO 100) / -10 ... +80 °C (QO 300) |
| Operation temperature range | -10 ... +60 °C (QO 100) / -10 ... +55 °C (QO 200) / -20 ... +65 °C (QO 300) |
| Storage temperature range | -10 ... +70 °C (QO 100) / -10 ... +55 °C (QO 200) / -20 ... +65 °C (QO 300) |

## Order data

| Model | Measuring range | Viscosity range | Mechanical measuring connectory | Max. working pressure | | Weight | Order Nº |
|---|---|---|---|---|---|---|---|
| | l/min | cSt | | bar | PSI | g | |
| **QO 100** | 0.1 ... 1.0 | 1.0 ... 150 | int. thread G1/8″ | 40 | 580 | 820 | F130-11-11.11 |
| **QO 200** | 0.2 ... 2.0 | 1.5 ... 150 | int. thread G½″ | 40 | 580 | 2,200 | F240-16-13.31 |
| | 0.5 ... 5.0 | 1.5 ... 150 | int. thread G½″ | 40 | 580 | 2,400 | F340-16-13.31 |
| | 1,0 ... 10 | 1.5 ... 150 | int. thread G½″ | 40 | 580 | 2,700 | F440-16-13.31 |
| **QO 300** | 0.1 ... 1.0 | 3.0 ... 2,300 | int. thread G¾″ | 16 | 232 | 1,400 | F740-57-35.64 |

# HySense® QL 100

Proven measuring turbine with attached manual restrictor valve to determine characteristic curves of pumps. Measures according to the flow principle, available with frequency or analog output signal.

## Technical data

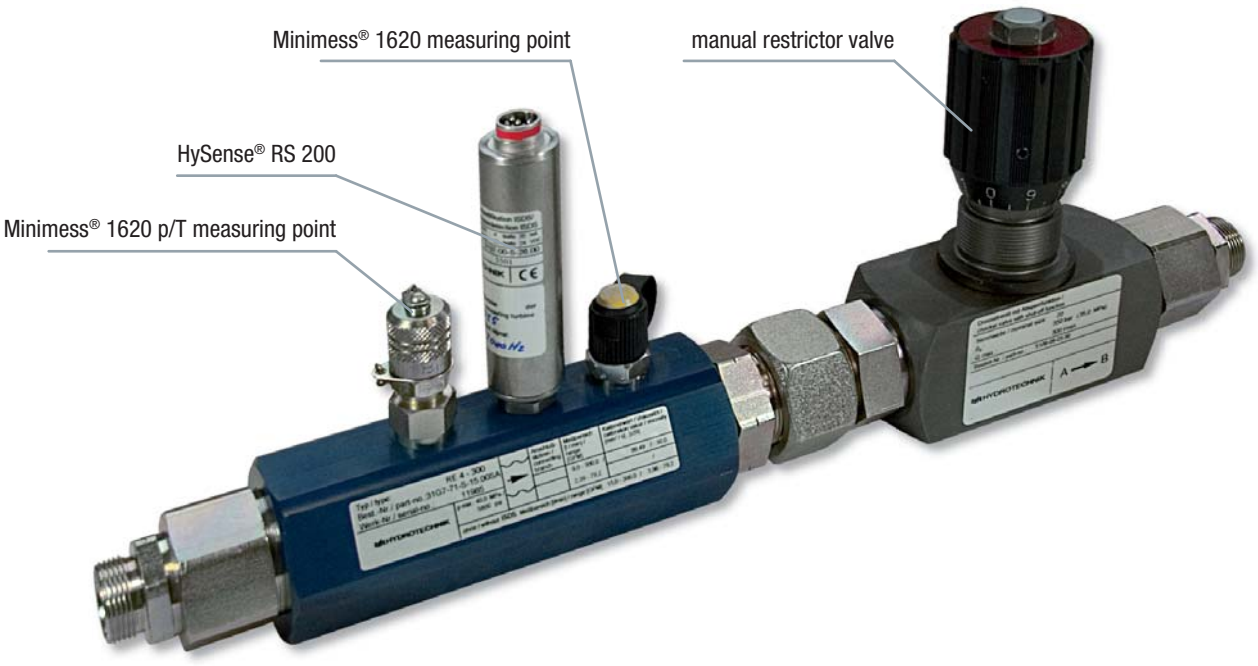
| | |
|---|---|
| Measuring principle | flow (turbine) |
| Viscosity range | 30 cSt (calibration) / 1... 100 cSt (possible range) |
| Output signal | frequency (QL 100) / 4 ... 20 mA (QL 110) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | ISO 228-G1″ |
| Protection type | IP 67 (QL 100) / IP 54 (QL 110) |
| Materials | high-grade steel X12CrNiS18 (casing) / 1.4122, 1.0718 (turbine wheel) |
| Sealing material | FKM |
| Weight | acc. to model (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | 12 ... 15 mA (QL 100) / 24 ... 31 mA (QL 110) |
| Error limits | acc. to model (see order data) |
| Response time | 0.5 ms (QL 100) / 250 ms (QL 110) |
| Temperature ranges | -20 ... +85 °C (operation, storage) / ≤ 120 °C (medium) |

## Order data

| Model | Output signal | Measuring range | Max. working pressure | | Error limits | Weight | Order Nº |
|---|---|---|---|---|---|---|---|
| | | l/min | bar | PSI | | g | |
| **QL 100** | frequency | 15 ... 300 | 350 | 5,000 | ± 0.5 % v.MW | 4,325 | 31VB-71-S-35.030 |
| **QL 110** | 4 ... 20 mA | 15 ... 300 | 350 | 5,000 | ± 0.7 % v. EW | 4,435 | 31GB-71-S-35.030 |



# HySense® QL 200

Specially designed measuring turbine with integrated manual restrictor valve to determine the characteristic curves of pumps. Measured according to the flow principle, available with frequency or analog output signal.

## Technical data

| | |
|---|---|
| Measuring principle | flow (turbine) |
| Viscosity range | 30 cSt (calibration) / 1... 100 cSt (allowed range) |
| Output signal | frequency (QL 200) / 4 ... 20 mA (QL 210) |
| Electrical measuring connector | M16 x 0.75, 6 pole (plug) |
| Mechanical measuring connector | ISO 228-G1¼" |
| Protection type | IP 67 (QL 200) / IP 54 (QL 210) |
| Materials | 3.4365 (casing) / 1.0718 (turbine wheel) |
| Sealing material | FKM |
| Weight | acc. to model (see order data) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | 12 ... 15 mA (QL 200) / 24 ... 31 mA (QL 210) |
| Error limits | acc. to model (see order data) |
| Response time | 0.5 ms (QL 200) / 250 ms (QL 210) |
| Temperature ranges | -20 ... +85 °C (operation, storage) / ≤ 120 °C (medium) |

## Order data

| Model | Output signal | Measuring range | Max. working pressure | | Error limits | Weight | Order Nº |
|---|---|---|---|---|---|---|---|
| | | l/min | bar | PSI | | g | |
| **QL 200** | frequency | 12 ... 600 | 420 | 6,000 | ± 0.5 % v.MW | 6,520 | 31VB-72-35.030S2 |
| **QL 210** | 4 ... 20 mA | 12 ... 600 | 420 | 6,000 | ± 0.7 % v. EW | 6,630 | 31GB-72-35.030S2 |

# HySense® QL 326

Load valve with pressure limitation valve and pre-amplifier designed for pump tests. The recording of the characteristic curve dependant on pressure can be executed recisely and repeatedly by programming the desired pressure curve.

## Technical data

| | |
|---|---|
| Measuring principle | flow (turbine) |
| Viscosity range | 30 cSt (calibration) / 1... 100 cSt (allowed range) |
| Output signal | CAN (usable for measuring and control communication, too) |
| Electrical measuring connector | M12x1, 5 pole (plug) |
| Mechanical measuring connector | ISO 228-G1¼" |
| Protection type | IP 54 |
| Materials | 3.4365 (casing) / 1.0718 (turbine wheel) |
| Sealing material | FKM |
| Weight | ~ 6,500 g |

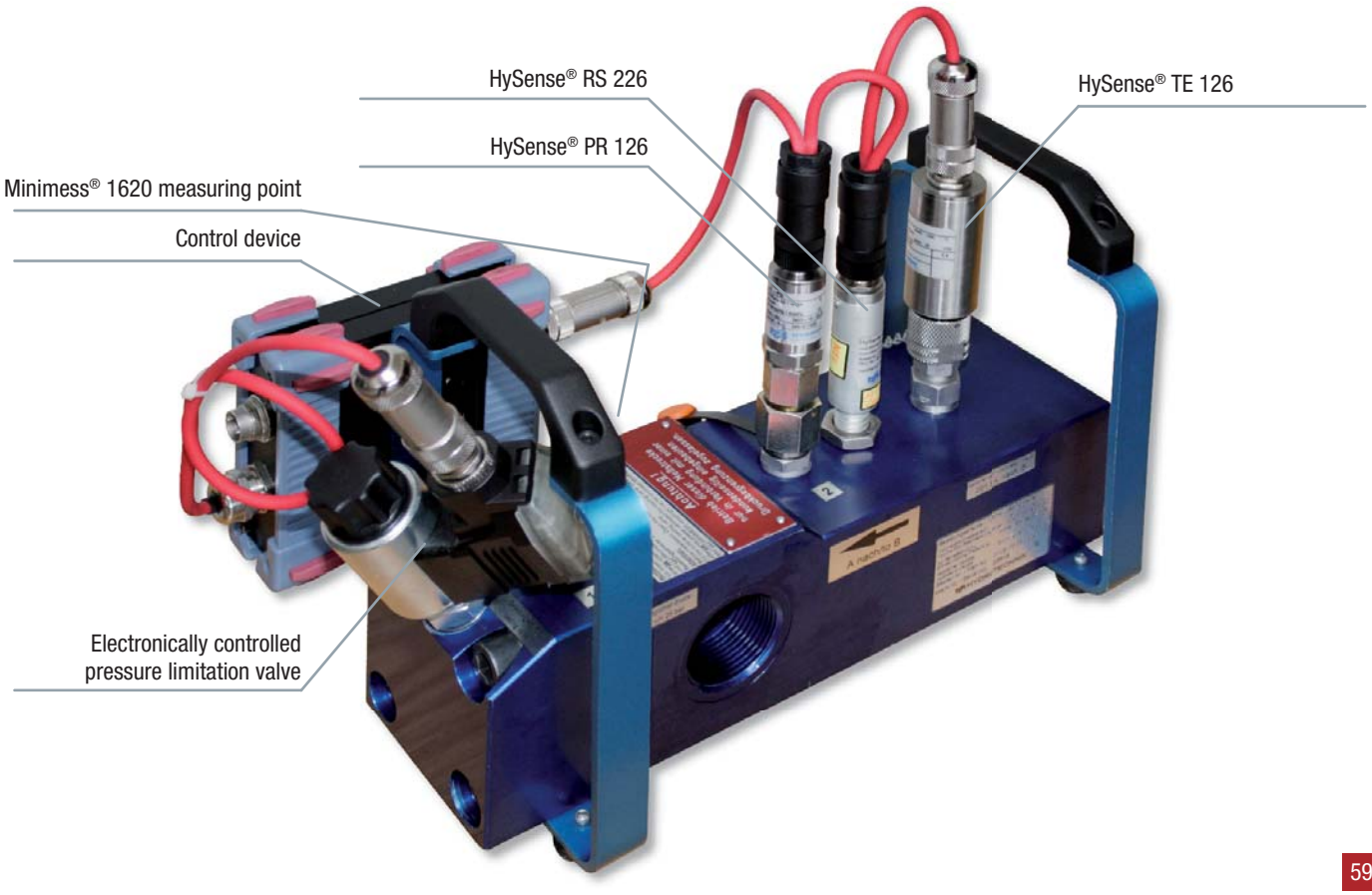
## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 12 ... 24 VDC |
| Current consumption | max. 1 A |
| Error limits | ± 0.5 % |
| Response time | ≤ 50 ms |
| Temperature ranges | -20 ... +85 °C (operation, storage) / ≤ 120 °C (medium) |

## Order data

| Model | Measuring range | | Max. working pressure | Order Nº |
|---|---|---|---|---|
| | l/min | bar | PSI | |
| **QL 326** | 16 ... 600 | 420 | 6,000 | 31VB-72-P5.030C3 |

For safe operation we recommend to install an external pressure safeguarding. This must be provided by the customer, e.g. by installing a pressure limitation valve upstream of the load valve, or via the upstream hydraulic system.



# HySense® RS 110

Rotational speed sensor with reflection foil detection. Works with pulsating red light, a polarisation filter avoids disturbin reflections. The sensor measures reliably from distances up to 500 mm.

## Technical data

| | |
|---|---|
| Measuring principle | auto-collimation |
| Range | 0 ... 500 mm (other ranges on request) |
| Output signal | frequency / 4 ... 20 mA (with f/I converter) |
| Electrical measuring connector | M16 x 0.75, 5 pole (plug) |
| Protection type | IP 67 (with screwed plug) |
| Material | Plastic (casing) |
| Weight | ~ 141 g (frequency output signal) / ~ 320 (analog output signal) |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 10 ... 30 VDC |
| Current consumption | < 30 mA |
| Response time | 500 µs |
| Temperature ranges | -40 ... +60 °C (operation) / -40 ... +75 °C (storage) |

## Order data & Accessories

| | |
|---|---|
| HySense® RS 110, frequency output signal (incl. 25 reflection badges) | 3130-02-01.00 |
| HySense® RS 110, output signal 4 ... 20 mA (incl. 25 reflection badges) | 3130-06-01.00 |
| HySense® RS 100*, output signal 4 ... 20 mA, ISDS (incl. 25 reflection badges) | 3130-06-S-01.00 |
| 50 reflection badges | 8840-02-01.01 |
| Magnetic holder | 3130-03-01.00 |

*: version for MultiHandy 2020

# HySense® RS 210

Inductive sensor for special applications. Detects e.g. the teeth of cog wheels, then the rotational speed of the cog wheel can be calculated.

## Technical data

| | |
|---|---|
| Measuring principle | inductive (with integrated amplifying circuit) |
| Output signal | frequency (square wave) |
| Electrical measuring connector | M16 x 0.75, 5 pole (plug) |
| Protection type | IP 67 (with screwed plug) |
| Material | Aluminium (anodised) |
| Weight | ~ 50 g |

## Operating limits

| | |
|---|---|
| Mounting orientation | arbitrary |
| Supply voltage | 6,5 ... 30 VDC |
| Current consumption | 12 mA |
| Temperature ranges | -20 ... +85 °C (operation, storage) |

## Order data & Accessories

| | |
|---|---|
| HySense® RS 210, frequency output signal, M10 x 0,75 | 3107-00-09.00 |
| HySense® RS 210, frequency output signal, M14 x 1 | 31W7-00-09.00 |

# Condition Monitoring

Condition Monitoring is the supervision of the status of a machine or plant, to draw conclusions on the demand for maintenance or repair measures from the changing of certain parameters. This allows to plan such measures exactly and possibly reduce downtimes significantly.

Beside measuring systems for the monitoring of measurands like pressure, temperature, volume flow rate, rotational speed a.s.o. Hydrotechnik also offers a particle counter for the diagnosis and supervision of the oil cleanliness in hydraulic systems.

# Patrick the Particle Counter


Optical particle monitor working according to the light-extinction principle. Can be used to monitor the impurity level and the purity trend of liquids very accurately. The purity classes can either be displayed according to ISO4406:99 or SAE AS4059E.

- ✓ **Optical particle monitor:**
  detects pollutions in hydraulic oils
- ✓ **Three in one:**
  stand-alone particle monitor, sensor, Condition Monitoring
- ✓ **High usability:**
  displays particle size classes according to ISO or SAE
- ✓ **Flexible use:**
  data transfer via CAN, USB adaptor or RS 232

## Operation type and limits

| | |
|---|---|
| Measuring principle | light extinction |
| Working pressure | ≤ 420 bar (dynamic) • ≤ 600 bar (static) |
| Allowed fluids | mineral and ester fluids, biologic oils |
| Allowed fluid temperature | -20 ... +80 °C |
| Operation temperature | -20 ... +80 °C (at 0 ... 95 % rel. humidity) |
| Allowed volume flow rate | 50 ... 400 ml/min |

## Qualities

| | |
|---|---|
| Signal output | 4 ... 20 mA |
| Interfaces | RS 232, CANopen |
| Fluid connectors | 2x Minimess® ¼“, screw series 1620 |
| Electrical connector | M12 x 1, 8 pole |
| Measuring range | 4 ... 25 (purity grade acc. to ISO 4406:99) |
| Measuring accuracy | ± 1 purity class |
| Supply voltage | 9 ... 36 V DC |
| Current consumption | 65 ... 180 mA (due to supply voltage) |

# Patrick the Particle Counter Order data

## Single unit

| Range of delivery | Order Nº |
|---|---|
| Patrick the Particle Counter<br>• **HYDRO***com* 6 Base | 3160-00-76.00 |

## Accessories – Cables

| | | | |
|---|---|---|---|
| CAN connection to existing system environment | plug M12x1, 8 pole – open cable ends | 2.5 m | 8824-T1-02.50 |
| | | 5.0 m | 8824-T1-05.00 |
| | | 10.0 m | 8824-T1-10.00 |
| CAN connection to MultiSystem 5060 Plus and MultiSystem 4010 | plug M12x1, 8 pole – plug M12x1, 8 pole Y distributor required | 2.5 m | 8824-T2-02.50 |
| | | 5.0 m | 8824-T2-05.00 |
| | | 10.0 m | 8824-T2-10.00 |
| CAN connection to MultiSystem 5060 | jack M12x1, 8 pole – Mini DIN plug, 8 pole Y distributor and separate power supply required | 2.5 m | 8824-T3-02.50 |
| | | 5.0 m | 8824-T3-05.00 |
| | | 10.0 m | 8824-T3-10.00 |
| Connect Patrick to PC | plug M12x1, 8 pole – USB plug | 2.0 m | 8824-T4-02.00 |
| CAN connection to MultiSystem / MultiControl 8050 | plug M12x1, 8 pole – plug D-sub, 9 pole Y distributor and separate power supply required | 2.5 m | 8824-T5-02.50 |
| | | 5.0 m | 8824-T5-05.00 |
| | | 10.0 m | 8824-T5-10.00 |
| CAN connection to MS 5060 Plus and MS 4010 | jack – plug M12x1, 8 pole, use without Y distributor | 5.0 m | 8824-T6-05.00 |
| | | 10.0 m | 8824-T6-10.00 |
| Connect Patrick to RS 232 interface | plug M12x1, 8 pole – jack D-sub, 9 pole | 2.5 m | 8824-T7-02.50 |
| | | 5.0 m | 8824-T7-05.00 |
| | | 10.0 m | 8824-T7-10.00 |

## Accessories – Others

| | | |
|---|---|---|
| Power pack with country-specific adaptors | | 8812-00-00.36 |
| Car connection cable, 12 ... 24 V DC, 5.0 m | | 8824-T8-05.00 |
| Y distributor, M12x1, 8 pole, jack to plug / jack | | 8808-50-01.03 |
| Minimess® hose 1620*, e.g. 1.5 m | | S110-AC-AC-0150 |
| Minimess® measuring point 1620 ISO 228-G¼", form F, sealing NBR | with faceplate 0.22 mm | 2103-01-18.00F1N |
| | with faceplate 0.30 mm | 2103-01-18.00F2N |
| | with faceplate 0.18 mm | 2103-01-18.00F3N |
| Minimess® flow controller, deceleration valve cartridge, Ø 0.4 mm, mesh 125 µm | | 2103-A0-02.00 |

*: further Minimess® products and hose assemblies are contained in our Minimess® catalog

# Software Products

## HYDRO*com* 6

- ✓ **Proceed data:** transfer, import, export
- ✓ **Process data:** evaluate, analyse, prepare
- ✓ **Present data:** diagrams, tables, histograms, ...
- ✓ **Document measurements:** test reports, measuring protocols, QA reports

| | |
|---|---|
| **HYDRO***com* 6 Professional (3 licenses) | 8874-19-01.01 |
| **HYDRO***com* 6 Full (3 licenses) | 8874-19-01.02 |
| **HYDRO***com* 6 Base | 8874-19-01.03 |
| Upgrade **HYDRO***com* 6 Full to Professional (3 licenses) | 8874-19-02.01 |
| **HYDRO***com* 6 Professional (15 licenses) | 8874-19-03.01 |
| **HYDRO***com* 6 Full (15 licenses) | 8874-19-03.03 |

## HYDRO*link*

- ✓ **Remote control:** full control of all functions of the instrument
- ✓ **Collect measuring data:** measure online and save on the PC

| | |
|---|---|
| **HYDRO***link* (license for 1 measuring instrument) | 8874-00-07.01 |

## HYDRO*gen*
## HYDRO*run*

- ✓ **Program measuring sequences:** to map test and measuring regulations
- ✓ **Standardise measuring tasks:** to increase quality and avoid errors
- ✓ **Document measuring data:** court-proof reconstructuion of all measuring steps
- ✓ **Easy programming:** by object-oriented function principle

| | |
|---|---|
| **HYDRO***gen* (license for 1 measuring instrument) | 8874-01-01.55 |
| **HYDRO***run* (execute **HYDRO***gen* measuring sequences in PC or measuring instrument) | cont. in **HYDRO***gen* |

## HYDRO*boot*

- ✓ **Firmware update:** keep your instruments topical

| | |
|---|---|
| **HYDRO***boot* (license-free, download free of charge from www.hydrotechnik.com) | 8874-00-06.01 |

# Accessories – Signal cables

## Measuring cable MKS 03

Shielded measuring cables M16 x 0.75 (6 pole) for all Hydrotechnik measuring instruments, available in two versions: standard for most applications and HighEnd for the use with rough environmental conditions



| Cable | Protection type | Extr. force Nm | Beginning | End | Length m | Order Nº |
|---|---|---|---|---|---|---|
| Standard measuring cable | IP 40 | 160 | | | 2.5 | 8824-S1-02.50S |
| | | | | | 5.0 | 8824-S1-05.00S |
| | | | | | 10.0 | 8824-S1-10.00S |
| Standard extension | IP 40 | 160 | | | 10.0 | 8824-S3-10.00S |
| | | | | | 20.0 | 8824-S3-20.00S |
| Standard sensor cable | IP 40 | 160 | | | 2.5 | 8824-S6-02.50S |
| | | | | | 5.0 | 8824-S6-05.00S |
| | | | | | 10.0 | 8824-S6-10.00S |
| HighEnd measuring cable | IP 67 | 300 | | | 2.5 | 8824-S1-02.50H |
| | | | | | 5.0 | 8824-S1-05.00H |
| | | | | | 10.0 | 8824-S1-10.00H |
| HighEnd extension | IP 67 | 300 | | | 10.0 | 8824-S3-10.00H |
| | | | | | 20.0 | 8824-S3-20.00H |
| HighEnd sensor cable | IP 67 | 300 | | | 2.5 | 8824-S6-02.50H |
| | | | | | 5.0 | 8824-S6-05.00H |
| | | | | | 10.0 | 8824-S6-10.00H |

## Measuring cable MK 15

Shielded measuring cable M16 x 0.75 (5 pole) with open cable ends to connect the stationary measuring devices SEG 1060 and Compare

| Cable | Protection type | Extr. force Nm | Beginning | End | Length m | Order Nº |
|---|---|---|---|---|---|---|
| Standard measuring cable | IP 40 | 160 | | | 2.5 | 8824-C1-02.50Y |
| | | | | | 5.0 | 8824-C1-05.00Y |
| | | | | | 10.0 | 8824-C1-10.00Y |

## Separator cable

Shielded measuring cables to connect the combined sensor TP 180 to Hydrotechnik measuring instruments; one jack M16 x 0.75 (8 pole) is separated to two plugs M16 x 0.75 (5 pole)

| Cable | Protection type | Extr. force Nm | Beginning | End | Length m | Order Nº |
|---|---|---|---|---|---|---|
| Standard meas. cable | IP 40 | 160 | | | 2.5 | 8824-D6-02.50 |
| | | | | | 5.0 | 8824-D6-05.00 |

# Accessories – Signal cables

## Connection cable MultiEPC

Shielded connection cables M12 x 1 (5 pole) to connect the Hydrotechnik pressure switch MultiEPC, available in straight and angled versions

| Cable | Version | Beginning | End | Length | Order Nº |
|---|---|---|---|---|---|
| | | | | m | |
| Pressure switch connection cable | straight |  |  | 2.0 | 8824-L0-02.00 |
| | | | | 5.0 | 8824-L0-05.00 |
| | | | | 10.0 | 8824-L0-10.00 |
| Pressure switch connection cable | 90° |  |  | 2.0 | 8824-L1-02.00 |
| | | | | 5.0 | 8824-L1-05.00 |
| | | | | 10.0 | 8824-L1-10.00 |

## Connection cable Patrick

Shielded cables M12 x 1 (8 pole) to connect the particle counter Patrick to Hydrotechnik measuring instruments or other environments

| | | | | |
|---|---|---|---|---|
| CAN connection to existing system environment |  M12x1, 8 pole |  | 2.5 m | 8824-T1-02.50 |
| | | | 5.0 m | 8824-T1-05.00 |
| | | | 10.0 m | 8824-T1-10.00 |
| CAN connection to MultiSystem 5060 Plus and MultiSystem 4010 incl. Y distributor |  M12x1, 8 pole |  M12x1, 8 pole | 2.5 m | 8824-T2-02.50 |
| | | | 5.0 m | 8824-T2-05.00 |
| | | | 10.0 m | 8824-T2-10.00 |
| CAN connection to MultiSystem 5060 |  M12x1, 8 pole |  Mini-DIN, 8 pole | 2.5 m | 8824-T3-02.50 |
| | | | 5.0 m | 8824-T3-05.00 |
| | | | 10.0 m | 8824-T3-10.00 |
| Connect Patrick to a PC |  M12x1, 8 pole |  USB | 2.0 m | 8824-T4-02.00 |
| CAN connection to MultiSystem / MultiControl 8050 |  M12x1, 8 pole |  D-Sub, 9 pole | 2.5 m | 8824-T5-02.50 |
| | | | 5.0 m | 8824-T5-05.00 |
| | | | 10.0 m | 8824-T5-10.00 |
| CAN connection to MS 5060 Plus and MS 4010 |  M12x1, 8 pole |  M12x1, 8 pole | 5.0 m | 8824-T6-05.00 |
| | | | 10.0 m | 8824-T6-10.00 |
| Connect Patrick to a RS 232 interface |  M12x1, 8 pole |  D-Sub, 9 pole | 2.5 m | 8824-T7-02.50 |
| | | | 5.0 m | 8824-T7-05.00 |
| | | | 10.0 m | 8824-T7-10.00 |

## Connection cable MultiMeter

| | | |
|---|---|---|
| ... for MultiSystem 5060 Plus and MultiSystem 4010 | 2.0 m | 8824-R6-02.00 |

Shielded cable to connect the MultiMeters Voltcraft VD to the RS 232 interface of Hydrotechnik measuring instruments.

# Accessories – CAN

## Connection cables measuring instruments

Shielded cables to connect a CAN line to Hydrotechnik measuring instruments. Use these cables to connect the MultiXtend modules with CAN output, too.

| Measuring instrument | Beginning | End | Length | Order Nº |
|---|---|---|---|---|
| MultiSystem 5060 to CAN sensor or MultiXtend | Mini-DIN 8 pole | M12 x 1 5 pole | 2.5 m | 8824-M5-02.50 |
| | | | 5.0 m | 8824-M5-05.00 |
| | | | 10.0 m | 8824-M5-10.00 |
| MultiSystem 5060 to CAN | Mini-DIN, 8 pole | | 5.0 m | 8824-M2-05.00 |
| MultiSystem 4010 / 5060 Plus to CAN sensor or MultiXtend | M12x1, 8 pole | M12x1, 5 pole | 2.5 m | 8824-R7-02.50 |
| | | | 5.0 m | 8824-R7-05.00 |
| | | | 10.0 m | 8824-R7-10.00 |
| MultiSystem 4010 / 5060 Plus to CAN | M12x1, 8 pole | | 5.0 m | 8824-R9-05.00 |
| MultiSystem / MultiControl 8050 to CAN sensor or MultiXtend | D-Sub, 9 pole | M12x1, 5 pole | 2.5 m | 8824-N1-02.50 |
| | | | 5.0 m | 8824-N1-05.00 |
| | | | 10.0 m | 8824-N1-10.00 |

## CAN connection cables

Shielded cables to build-up a CAN line.

| Measuring instrument | Beginning | End | Length | Order Nº |
|---|---|---|---|---|
| Connect MultiXtend or CAN sensors | M12x1, 5 pole | M12x1, 5 pole | 1.0 m | 8824-N3-01.00 |
| | | | 2.5 m | 8824-N3-02.50 |
| | | | 5.0 m | 8824-N3-05.00 |
| Connect MultiXtend or CAN sensors to an existing CAN environment | M12x1, 5 pole | | 1.0 m | 8824-M7-01.00 |
| | | | 2.5 m | 8824-M7-02.50 |
| | | | 5.0 m | 8824-M7-05.00 |
| Connect MultiXtend or CAN sensors to an existing CAN environment | | M12x1, 5 pole | 1.0 m | 8824-M8-01.00 |
| | | | 2.5 m | 8824-M8-02.50 |
| | | | 5.0 m | 8824-M8-05.00 |

8812-11-01.00

## Other accessories

| | |
|---|---|
| Y distributor M12x1 (5 pole), 2x plug, 1x jack | 8808-50-01.01 |
| Terminal resistor 120 Ω, plug M12 x 1 (5 pole) | 8872-02-01.01 |
| Power pack (table version) for CAN power supply, 115 / 230 V AC, plug M12x1 | 8812-00-00.34 |
| Adaptor for Hydrotechnik standard power pack, plug M12x1 | 8812-11-01.00 |

8808-50-01.01

8872-02-01.01

# Accessories – Minimess®

## Measuring points with faceplate

| | |
|---|---|
| Minimess® 1620, ISO 228-G¼″ form F, sealing NBR, with faceplate 0.22 mm | 2103-01-18.00F1N |
| Minimess® 1620, ISO 228-G¼″ form F, sealing NBR, with faceplate 0.30 mm | 2103-01-18.00F2N |
| Minimess® 1620, ISO 228-G¼″ form F, sealing NBR, with faceplate 0.18 mm | 2103-01-18.00F3N |

## p/T measuring points

| | |
|---|---|
| Minimess® 1620 p/T, ISO 228-G¼″ form F, sealing NBR, metal cap | 2149-04-15.13N |
| Minimess® 1620 p/T, ISO 228-G¼″ form F, sealing FKM, metal cap | 2149-04-15.53N |
| Minimess® 1620 p/T, M10x1 form G, sealing NBR, metal cap | 2149-04-19.13N |
| Minimess® 1620 p/T, M10x1 form G, sealing FKM, metal cap | 2149-04-19.53N |

## Straight direct connectors

| | |
|---|---|
| Minimess® 1215, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2101-07-18.62N |
| Minimess® 1215, ISO 228-G¼″ external (for HySense® PR 3xx) | 2101-07-41.62N |
| Minimess® 1615, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2102-07-18.62 |
| Minimess® 1615, ISO 228-G¼″ external (for HySense® PR 3xx) | 2102-07-41.62 |
| Minimess® 1620, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2103-07-18.62N |
| Minimess® 1620, ISO 228-G¼″ external (for HySense® PR 3xx) | 2103-07-41.62N |
| Minimess® 1604, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2106-07-18.62N |

## 90° direct connectors

| | |
|---|---|
| Minimess® 1215, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2146-14-02.00N |
| Minimess® 1215, ISO 228-G¼″ external (for HySense® PR 3xx) | 2146-54-19.20N |
| Minimess® 1615, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2146-57-05.00 |
| Minimess® 1615, ISO 228-G¼″ external (for HySense® PR 3xx) | 2146-54-19.13 |
| Minimess® 1620, ISO 228-G¼″ internal (for HySense® PR 1xx, PR 4xx and MultiEPC) | 2146-13-05.00N |
| Minimess® 1620, ISO 228-G¼″ external (for HySense® PR 3xx) | 2146-54-19.40N |

## Flow controller

| | |
|---|---|
| Minimess® 1620, deceleration valve cartridge, Ø 0.4 mm, mesh 125 µm | 2103-A0-02.00 |

Further Minimess® products are contained in our Minimess® catalog.

# Accessories – Power supply

## Power packs and cables

Plug version

Table version

| | | | |
|---|---|---|---|
| Table | MS/MC/MP 8050 | 90 ... 265 V AC, 47 ... 63 Hz – 24 V DC, 60 W | 8812-00-00.27 |
| | MS 4010/5060/Plus | 100 ... 240 V AC – 24 V DC, 630 mA | 8812-02-01.00 |
| | MH 3020/3050 | 100 ... 240 V AC – 24 V DC, 630 mA | 8812-02-01.00 |
| Plug | MS 4010/5060/Plus | 115 ... 230 V AC – 24 V DC, incl. country-spec. adaptors | 8812-20-02.00 |
| | MH 3020/3050 | 115 ... 230 V AC – 24 V DC, incl. country-spec. adaptors | 8812-20-02.00 |
| | MB 306x | | 8812-00-00.35 |
| | MH 2020 | incl. country-specific adaptors | 8812-00-00.33 |
| | Patrick | incl. country-specific adaptors | 8812-00-00.36 |
| Car | MS 4010/5060/Plus | Connection cable, 5.0 m | 8824-64-05.00 |
| | MH 2020 | 12 ... 24 V DC – 6 V DC | 8812-09-04.00 |
| | Patrick | Connection cable, 5.0 m | 8824-T8-05.00 |

## Batteries

| | | |
|---|---|---|
| MultiSystem 5060 / 5060 Plus | 14.4 V DC, 2,000 mAh, with temperature sensor | 8873-07-01.00 |
| MultiSystem 5050 | 14.4 V DC, 1,200 mAh, NiCd | 8873-02-00.07 |
| MultiSystem 4010 | 14.4 V DC, 1,100 mAh, NiMH | 8873-08-02.00 |
| MultiBox 306x | BatteryPack, 14.4 V DC, 2,000 mAH | 8873-30-01.00 |
| MultiHandy 3050 | 14.4 V DC, 1,800 mAh, NiMH | 8873-08-01.00 |
| MultiHandy 3020 / 3025 | 14.4 V DC, 1,100 mAh, NiMH | 8873-08-02.00 |

# Accessories – Others

## Protection and comfort

| | | |
|---|---|---|
| MultiSystem 8050 | Notebook bag | 8875-01-06.00 |
| MultiSystem 5060 / 5060 Plus | Artificial leather bag | 8875-01-07.00 |
| MultiSystem 4010 / 5060 Plus | Neck strap set with holders | 8854-00-00.01 |
| MultiHandy 3050 | Nylon bag | 8875-01-05.00 |
| MultiHandy 3020 / 3025 | Nylon bag | 8875-01-02.00 |

## Mounting

| | | |
|---|---|---|
| MultiSystem 4010 / 5060 Plus | Set with cap rail, clip and screws | 8854-00-00.02 |
| MultiSystem 4010 / 5060 Plus | Velcro tape set (5 pieces) | 8840-00-00.13 |

# Accessories – Others

## Transportation cases

| | | |
|---|---|---|
| MultiSystem/MultiControl 8050 | plastic case with bottom compartment | 3160-00-65.03 |
| MultiSystem 4010 / 5060 Plus | black, with compartments for turbine/Patrick/MultiXtend | 8859-02-02.03 |
| MultiSystem 4010 / 5060 Plus | red, with foam inlays | 8854-15-00.14K |
| MultiBox 306x | plastic, with turbine compartment | 3160-00-62.09 |
| MultiHandy 3020 / 3025 / 3050 | plastic, with turbine compartment | 3160-00-62.06 |
| MultiHandy 2020 | plastic, red | 3160-00-69.01 |

## Data

| | |
|---|---|
| Data CD | 8874-16-00.01 |

## Sensor accessories

3130-03-01.00

| | | |
|---|---|---|
| Inductive sensor, ISDS, IP 67 (for HySense® QT 1xx / 2xx) | M10 x 0.75 | 3107-00-S-09.00 |
| | M14 x 1 | 31W7-00-S-09.00 |
| Inductive sensor, ISDS, IP 67 (for HySense® QL 100) | M10 x 0.75 | 3107-00-S-09.70 |
| | M14 x 1 | 31W7-00-S-09.70 |
| Inductive sensor with f/I converter, ISDS, 0 ... 20 mA, IP 67 (for HySense® QT/QL x1x) | M10 x 0.75 | 3107-00-S-25.00 |
| | M14 x 1 | 31W7-00-S-25.00 |
| Inductive sensor with f/I converter, ISDS, 4 ... 20 mA, IP 67 (for HySense® QT/QL x1x) | M10 x 0.75 | 3107-00-S-26.00 |
| | M14 x 1 | 31W7-00-S-26.00 |
| GMR sensor, ISDS, frequency (for HySense® QG 1xx) | | 3107-00-S-45.00 |
| Reflection strap set, 50 pc., 25 x 10 mm (for HySense® RS 110) | | 8840-02-01.01 |
| Magnetic holder (for HySense® RS 110) | | 3130-03-01.00 |

8840-02-01.01

3107-00-S-25.00

3107-00-S-09.00

## Simulator

| | | |
|---|---|---|
| Signal generator | 2x analog, 1x frequency | 3160-00-00.43 |

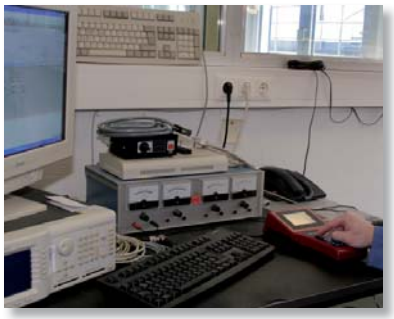
# Service & Support

## Maintenance

Regular maintenance is important for the functionality and value retention of your measuring technology investment. We inspect and clean all Hydrotechnik measuring instruments and replace used batteries or defective parts at reasonable cost.

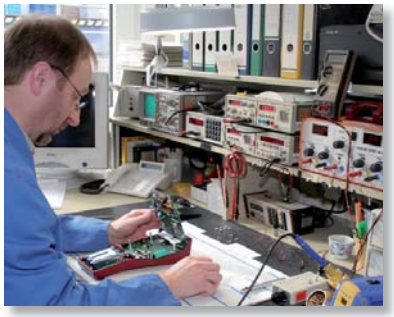
## Calibration

Only calibrated measuring instruments provide reliable measured values in the long run. We use precise laboratory installations to detect and compensate possible deviations of measuring devices. We are a certified DKD calibration laboratory and offer calibrations of all sensors, too, most suitable as measuring chain together with the instrument.



## Repair

Hydrotechnik measuring instruments are robust, reliable and long-living. In any case of damage, we repair in a fast and cost-effective way. A rental item can be provided during the repair time.



## Service Packages

We offer service packages for all Hydrotechnik measuring instruments to maintain their quality and functionality for a long time:

**Service package Basic**

- Cleaning of the casing
- Inspection of inputs, outputs, interfaces and keypad
- Execution of a memory test
- Renewal of identification and information labels
- Inspection and capacity test of the batteries
- Inspection of the interior for damages
- Measuring and control of the buffer battery
- Firmware update

**Service package Plus**

- Calibration and compensation of all measuring channels
- Completion of the calibration certificate
- Attachment of the calibration label

**Service package Professional**

- All elements of the service packages Basic and Plus

# Notes

**Hydrotechnik GmbH**
Holzheimer Str. 94 – 96 • 65549 Limburg • Germany
Phone +49 (0) 64 31 40 04-0 • Fax +49 (0) 64 31 4 53 08
www.hydrotechnik.com • info@hydrotechnik.com

HYDROTECHNIK

8898-01-00.84EN / Edition 5.1 / 10-2012