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# JUMO dTRANS T01 HART® / T01T HART® / T01 Junior / T01 Ex / T01 HART® Ex Programmable 2-wire transmitter

for connection to RTD temperature probes and thermocouples  
 for installation in : terminal head Form B to DIN 43729  
 for mounting on : rail

## Brief description

The 2-wire transmitter detects the temperature by means of an RTD temperature probe or a thermocouple. For RTD temperature probes, the probe can be connected in a 2-wire circuit, 3-wire circuit, or 4-wire circuit. The probe type, connection type, and measuring range can be configured using a setup program. The output signal 4 to 20 mA or reversed 20 to 4 mA is available in a linearized way (temperature linear).

The device is designed for industrial applications and complies with the respective European standards to guarantee electromagnetic compatibility (EMC).

The inexpensive version dTRANS T01 Junior type 707014/... supports a limited selection of RTD temperature probes and thermocouples. This type does not have a customer-specific linearization.

The versions 707015/... and 707016/... are electrical equipment for use in a potentially explosive area.

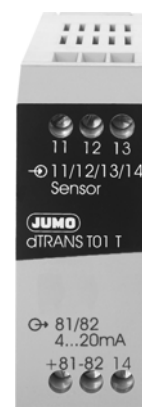
The transmitters JUMO dTRANS T01 (types 707011/..., 707013/... and 707016/...) can also be programmed using a HART® modem in conjunction with a PC setup program.



Type 707011/... (HART®),  
 Type 707015/... (Ex),  
 Type 707016/... (HART® Ex)



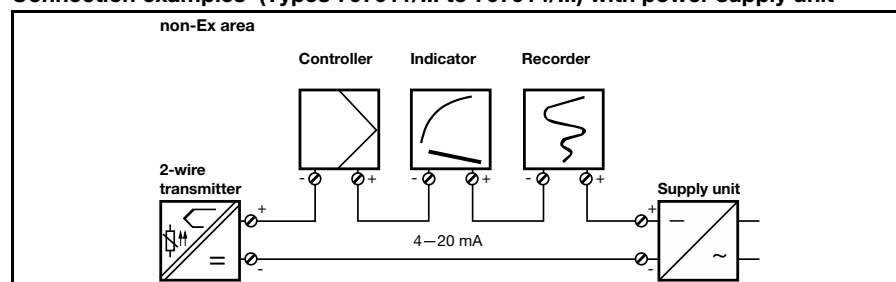
Type 707014/... (Junior)



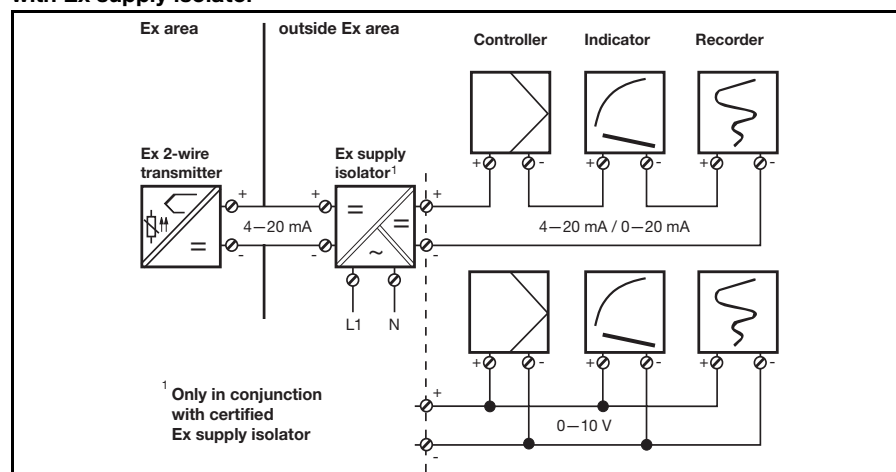
Type 707013/... (HART®)

## System diagrams

### Connection examples (Types 707011/... to 707014/...) with power supply unit



### Connection examples (Types 707015/... and 707016/...) for Ex application with Ex supply isolator



## Features

- Types 707011/..., 707013/... and 707016/... with HART® interface
- Type 707015/... Ex and IECEx version  
 Ex II 1 G Ex ia IIC T6-T4 Ga  
 Ex ia IIC T6...T4 Ga
- Type 707016/... with HART® interface and as Ex version  
 Ex II 1 G Ex ia IIC T6/T5/T4  
 II 2 G Ex ia IIC T6/T5/T4
- Type 707013/... in rail-mounting housing
- input and output electrically isolated
- freely configurable ranges
- customized linearization for RTD temperature probe and thermocouple (excepting 707014/...)



## Technical data

### Input for Thermocouple for the types 707011/..., 707013/..., 707015/..., 707016/...

| Designation                                | Range limits                                                                                                                                                                                   | Accuracy <sup>a</sup> (typical) |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Fe-CuNi „L“ DIN 43710 <sup>c</sup>         | -200 ... +900 °C                                                                                                                                                                               | typ. 0,5 K                      |
| Fe-CuNi „J“ DIN EN 60584                   | -210 ... +1200 °C                                                                                                                                                                              | typ. 0,5 K above -150 °C        |
| Cu-CuNi „U“ DIN 43710 <sup>c</sup>         | -200 ... +600 °C                                                                                                                                                                               | typ. 0,5 K                      |
| Cu-CuNi „T“ DIN EN 60584 <sup>c</sup>      | -270 ... +400 °C                                                                                                                                                                               | typ. 0,5 K above -200 °C        |
| NiCr-Ni „K“ DIN EN 60584                   | -270 ... +1372 °C                                                                                                                                                                              | typ. 0,5 K above -140 °C        |
| NiCr-CuNi „E“ DIN EN 60584 <sup>c</sup>    | -270 ... +1000 °C                                                                                                                                                                              | typ. 0,5 K above -150 °C        |
| NiCrSi-NiSi „N“ DIN EN 60584 <sup>c</sup>  | -270 ... +1300 °C                                                                                                                                                                              | typ. 1 K above -100 °C          |
| Pt10Rh-Pt „S“ DIN EN 60584 <sup>c</sup>    | -50 ... +1768 °C                                                                                                                                                                               | typ. 2 K above 20 °C            |
| Pt13Rh-Pt „R“ DIN EN 60584 <sup>c</sup>    | -50 ... +1768 °C                                                                                                                                                                               | typ. 2 K above 50 °C            |
| Pt30Rh-Pt6Rh „B“ DIN EN 60584 <sup>c</sup> | 0 ... 1820 °C                                                                                                                                                                                  | typ. 2 K above 400 °C           |
| MoRe5-MoRe41 <sup>b</sup>                  | 0 ... 2000 °C                                                                                                                                                                                  | typ. 2 K above 500 °C           |
| W3Re-W25Re „D“ <sup>c</sup>                | 0 ... 2495 °C                                                                                                                                                                                  | typ. 1 K above 500 °C           |
| W5Re-W26Re „C“ <sup>c</sup>                | 0 ... 2320 °C                                                                                                                                                                                  | typ. 1 K above 500 °C           |
| Shortest span                              | Type L, J, U, T, K, E, N: 50 K<br>Type S, R, B: 500 K<br>Type MoRe5-MoRe41, D, C: 500 K                                                                                                        |                                 |
| Cold junction                              | Pt100 internal or external cold junction (adjustable from 0 ... 80 °C)                                                                                                                         |                                 |
| Cold junction accuracy                     | ±1 K                                                                                                                                                                                           |                                 |
| Sampling rate                              | >1 measurement per second                                                                                                                                                                      |                                 |
| Sensor current                             | 350 nA                                                                                                                                                                                         |                                 |
| Input filter                               | 1st order digital filter; filter constant adjustable:<br>- on Type 707015/... within the range 0 ... 125sec<br>- on Types 707011/..., 707013/... and 707016/... within the range 0 ... 100 sec |                                 |
| Features                                   | also programmable in °F; freely programmable range limits;<br>input isolated from output                                                                                                       |                                 |

<sup>a</sup> The accuracy refers to the maximum range span.

<sup>b</sup> Only for type 707015/...

<sup>c</sup> For type 707013/... on request only.

### Input RTD temperature probe for the types 707011/..., 707013/..., 707015/..., 707016/...

| Designation                                                                      | Range limits                                                                                                                                                                          | Range                                | Accuracy <sup>a</sup> |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| Pt100 DIN EN 60751                                                               | -200 ... +850 °C                                                                                                                                                                      | -100 ... +200 °C<br>-200 ... +850 °C | ±0,2 K<br>±0,4 K      |
| Pt100 JIS                                                                        | -200 ... +649 °C                                                                                                                                                                      | -100 ... +200 °C<br>-200 ... +649 °C | ±0,2 K<br>±0,4 K      |
| Pt500 DIN                                                                        | -200 ... +250 °C                                                                                                                                                                      | -100 ... +200 °C<br>-200 ... +250 °C | ±0,2 K<br>±0,4 K      |
| Pt1000 DIN                                                                       | -200 ... +250 °C                                                                                                                                                                      | -100 ... +200 °C<br>-200 ... +250 °C | ±0,2 K<br>±0,4 K      |
| Ni100                                                                            | -60 ... +250 °C                                                                                                                                                                       | -60 ... +250 °C                      | ±0,2 K                |
| Ni500                                                                            | -60 ... +150 °C                                                                                                                                                                       | -60 ... +150 °C                      | ±0,2 K                |
| Ni1000                                                                           | -60 ... +150 °C                                                                                                                                                                       | -60 ... +150 °C                      | ±0,2 K                |
| Connection circuit                                                               | 2-,3- or 4-wire circuit                                                                                                                                                               |                                      |                       |
| Shortest span                                                                    | 10 K                                                                                                                                                                                  |                                      |                       |
| Sensor lead resistance<br>- for 3-, 4-wire connection<br>- for 2-wire connection | ≤ 11 Ω per conductor<br>measuring resistance + ≤22 Ω internal lead resistance                                                                                                         |                                      |                       |
| Sensor current                                                                   | < 0,6 mA                                                                                                                                                                              |                                      |                       |
| Sampling rate                                                                    | > 1 measurement per second                                                                                                                                                            |                                      |                       |
| Input filter                                                                     | 1st order digital filter; filter constant adjustable:<br>- on type 707015/... within a range 0 ... 125s<br>- on types 707011/..., 707013/... and 707016/... within a range 0 ... 100s |                                      |                       |
| Features                                                                         | also programmable in °F; freely programmable range limits;<br>input isolated from output                                                                                              |                                      |                       |

<sup>a</sup> The accuracy refers to the maximum range span.

## Input thermocouple for the type 707014/...

| Designation                  | Range limits                                                                                              | Accuracy <sup>a</sup> (typical) |
|------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------|
| Fe-CuNi „J“ DIN EN 60584     | -210 ... +1200 °C                                                                                         | typ. 0,5K above -150 °C         |
| NiCr-Ni „K“ DIN EN 60584     | -270 ... +1372 °C                                                                                         | typ. 0,5K above -140 °C         |
| NiCrSi-NiSi „N“ DIN EN 60584 | -270 ... +1300 °C                                                                                         | typ. 1K above -100 °C           |
| Pt10Rh-Pt „S“ DIN EN 60584   | -50 ... +1768 °C                                                                                          | typ. 2K above 20 °C             |
| Pt13Rh-Pt „R“ DIN EN 60584   | -50 ... +1768 °C                                                                                          | typ. 2K above 50 °C             |
| Shortest span                | Type J, K, N: 50K<br>Type S, R: 500K                                                                      |                                 |
| Cold junction                | Pt100 internal or external cold junction (adjustable from 0 ... 80 °C)                                    |                                 |
| Cold junction accuracy       | ±1 K                                                                                                      |                                 |
| Sampling rate                | >1 measurement per second                                                                                 |                                 |
| Sensor current               | 350nA                                                                                                     |                                 |
| Input filter                 | 1st order digital filter; filter constant adjustable:<br>- on type 707014/... within the range 0 ... 125s |                                 |
| Features                     | also programmable in °F; freely programmable range limits;<br>input isolated from output                  |                                 |

<sup>a</sup> The accuracy refers to the maximum range span.

## Input RTD temperature probe for the type 707014/...

| Designation                                                                      | Range limits                                                                                               | Range                                | Accuracy <sup>a</sup> |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| Pt100 DIN EN 60751                                                               | -200 ... +850 °C                                                                                           | -100 ... +200 °C<br>-200 ... +850 °C | ±0,2 K<br>±0,4 K      |
| Pt100 JIS                                                                        | -200 ... +649 °C                                                                                           | -100 ... +200 °C<br>-200 ... +649 °C | ±0,2 K<br>±0,4 K      |
| Pt1000 DIN                                                                       | -200 ... +250 °C                                                                                           | -100 ... +200 °C<br>-200 ... +250 °C | ±0,2 K<br>±0,4 K      |
| Connection circuit                                                               | 2-,3- or 4-wire circuit                                                                                    |                                      |                       |
| Shortest span                                                                    | 10K                                                                                                        |                                      |                       |
| Sensor lead resistance<br>- for 3-, 4-wire connection<br>- for 2-wire connection | ≤ 11 Ω per conductor<br>measuring resistance + ≤22 Ω internal lead resistance                              |                                      |                       |
| Sensor current                                                                   | < 0,6 mA                                                                                                   |                                      |                       |
| Sampling rate                                                                    | > 1 measurement per second                                                                                 |                                      |                       |
| Input filter                                                                     | 1st order digital filter; filter constant adjustable:<br>- on type 707014/... within the range 0 ... 125 s |                                      |                       |
| Features                                                                         | also programmable in °F; freely programmable range limits;<br>input isolated from output                   |                                      |                       |

<sup>a</sup> The accuracy refers to the maximum range span.

## Measurement circuit monitoring

|                                                           |                                                                                                                                |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Underrange                                                | linear drop to 3.8 mA (as per NAMUR recommendation 43)                                                                         |
| Overrange                                                 | linear rise to 20.5 mA (as per NAMUR recommendation 43)                                                                        |
| Probe short circuit /<br>probe and lead break             | RTD temperature probe: ≤ 3.5 mA or ≥ 21.0 mA (configurable)<br>thermocouple: ≤ 3.5 mA or ≥ 21.0 mA (configurable) <sup>a</sup> |
| Current limiting on probe short circuit<br>or probe break | ≤ 23 mA                                                                                                                        |

<sup>a</sup> Probe short-circuit recognition is not possible for thermocouple.

**Output**

|                                                                                          | Types 707014/..., 707015/...                                                                                            | Types 707011/..., 707013/..., 707016/...        |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Output signal                                                                            | proportional DC current 4 ... 20 mA, 20 ... 4 mA                                                                        |                                                 |
| Electrical isolation                                                                     | between input and output                                                                                                | between input and output                        |
| Test voltage                                                                             | Type 707014/...: $U_{\text{peak}} = 1.0 \text{ kV/50 Hz}$<br>Type 707015/...: $U_{\text{peak}} = 3.75 \text{ kV/50 Hz}$ | $U = 2.0 \text{ kV/50 Hz}$                      |
| Transfer characteristic                                                                  | linear with temperature                                                                                                 |                                                 |
|                                                                                          | Type 707015/...: customized linearization                                                                               | customized linearization                        |
|                                                                                          | reversion of output signal                                                                                              |                                                 |
| Burden (Rb)                                                                              | $Rb = (U_b - 8 \text{ V}) / 0.022 \text{ A}$                                                                            | $Rb = (U_b - 11.5 \text{ V}) / 0.022 \text{ A}$ |
| Burden error                                                                             | $\leq \pm 0.02 \% / 100 \Omega^a$                                                                                       |                                                 |
| Calibration conditions / accuracy                                                        | 24V DC at approx. 22 °C / $\leq \pm 0.05 \%^a$                                                                          |                                                 |
| 1st order digital filter                                                                 | 0 — 125 sec configurable                                                                                                | 0 — 100 sec configurable                        |
| Step response 0 — 100 %                                                                  | < 2 sec (with filter constant 0 sec)                                                                                    |                                                 |
| Switch-on delay (correct measurement after connecting the supply voltage only after ...) | 5 sec                                                                                                                   | 4 sec                                           |

<sup>a</sup> All specified values refer to 20 mA full scale.

**Custom linearization**

|                                                |                                                               |
|------------------------------------------------|---------------------------------------------------------------|
| Types 707011/..., 707013/..., 707016/...       | maximum: 40 with linear interpolation<br>4th order polynomial |
| - Number of calibration points<br>- Polynomial |                                                               |
| Type 707015/...                                | maximum: 40 with linear interpolation                         |
| - Number of calibration points                 |                                                               |
| Type 707014/...                                | No custom linearization available                             |

**Supply**

|                                                         |                                                                 |                                                                                                          |
|---------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Supply voltage (Ub)<br>with reverse polarity protection | Type 707014/...: DC 8 ... 35V<br>Type 707015/...: DC 8 ... 30V  | Type 707011/...: DC 11.5 ... 35V<br>Type 707013/...: DC 11.5 ... 35V<br>Type 707016/...: DC 11.5 ... 30V |
| Supply voltage error                                    | $\leq \pm 0.01 \% \text{ per V deviation from } 24 \text{ V}^a$ |                                                                                                          |

<sup>a</sup> All specified values refer to 20 mA full scale.

**Environmental influences**

|                                                                                              |                                                                                                                                                                                                                                                |                                                                                                         |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Operating temperature range                                                                  | -40 to +85 °C                                                                                                                                                                                                                                  |                                                                                                         |
| Storage temperature range                                                                    | -40 to +100 °C                                                                                                                                                                                                                                 |                                                                                                         |
| Temperature error                                                                            | RTD temperature probe: $\leq \pm 0.005 \% \text{ per } ^\circ\text{C deviation from } 22 ^\circ\text{C}^a$<br>thermocouple: $\leq \pm 0.005 \% \text{ per } ^\circ\text{C deviation from } 22 ^\circ\text{C}^a$ plus accuracy of cold junction |                                                                                                         |
| Long-term stability                                                                          | $\leq 0.1 ^\circ\text{C per year}^b$ or $\leq 0.05 \% \text{ per year}^{b,c}$                                                                                                                                                                  |                                                                                                         |
| Climatic conditions                                                                          | rel. humidity $\leq 95 \%$ , with condensation                                                                                                                                                                                                 |                                                                                                         |
| Vibration strength                                                                           | according to GL characteristic 2                                                                                                                                                                                                               |                                                                                                         |
| Electromagnetic compatibility (EMC)<br>- interference emission<br>- immunity to interference | EN 61326-1<br>Class B <sup>d</sup><br>to industrial requirements                                                                                                                                                                               |                                                                                                         |
| IP protection<br>- in terminal head<br>- open mounting<br>- on rail                          | IP54<br>IP00<br>—                                                                                                                                                                                                                              | Types 707011/... and 707016/...: IP66<br>Types 707011/... and 707016/...: IP00<br>Type 707013/...: IP20 |

<sup>a</sup> All specified values refer to 20 mA full scale

<sup>b</sup> under calibration conditions

<sup>c</sup> % refer to the selected span. The larger value applies.

<sup>d</sup> The product is suitable for industrial use as well as for households and small businesses.

## Housing

|                    | Types 707011/..., 707014/...,<br>707015/..., 707016/...                                                                                      | Type 707013/...                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Material           | polycarbonate (encapsulated)                                                                                                                 | polycarbonate                                                                                            |
| Screw terminal     | $\leq 1.75 \text{ mm}^2$ ; max. tightening torque 0.6 Nm                                                                                     | $\leq 2.5 \text{ mm}^2$ ; max. tightening torque 0.6 Nm                                                  |
| Mounting           | in terminal head Form B (DIN EN 50446);<br>in surface-mounting case (on request);<br>in switchgear cabinet<br>(mounting bracket is required) | on DIN rail 35mm x 7.5mm (DIN EN 60715);<br>on DIN rail 15mm (DIN EN 60715);<br>on G rail (DIN EN 60715) |
| Operating position | unrestricted                                                                                                                                 |                                                                                                          |
| Weight             | approx. 40g                                                                                                                                  | approx. 90g                                                                                              |



## Version 707015/... (Ex) - Extract from the EC Type-Examination Certificate ZELM 99 ATEX 0018X

|                                                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Marking                                                                           | II 1 G Ex ia IIC T6–T4 Ga                                                                                      |
| Temp. range in “II 2 G” and “II 3 G”                                              | T6 = -40 to +55 °C / T5 = -40 to +70 °C / T4 = -40 to +75 °C                                                   |
| Temp. range in “II 1 G”                                                           | T6 = -40 to +40 °C / T5 = -40 to +50 °C / T4 = -40 to +60 °C                                                   |
| Supply circuit<br>Max. values at the terminals<br>1(+) and 2(-)                   | U <sub>i</sub> = 30 V DC<br>I <sub>i</sub> = 100 mA<br>P <sub>i</sub> = 750 mW                                 |
| Internal inductance<br>and capacitance                                            | L <sub>i</sub> = negligible<br>C <sub>i</sub> = negligible                                                     |
| Sensor circuit<br>Max. values at the terminals<br>3, 4, 5 and 6                   | U <sub>o</sub> = 9.6 V DC<br>I <sub>o</sub> = 4.5 mA<br>P <sub>o</sub> = 11 mW<br>linear output characteristic |
| Max. permissible external inductance<br>and capacitance<br>Ex ia IIC<br>Ex ia IIB | L <sub>o</sub> = 4.5 mH / C <sub>o</sub> = 709 nF<br>L <sub>o</sub> = 8.5 mH / C <sub>o</sub> = 1300 nF        |



## Version 707016/... (Ex) - Extract from the EC Type-Examination Certificate PTB 01 ATEX 2124

|                                                                                  |                                                                                                        |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Marking                                                                          | II 1 G Ex ia IIC T6/T5/T4<br>II 2 G Ex ia IIC T6/T5/T4                                                 |
| Temp. range in “II 2 G” and “II 3 G”                                             | T6 = -40 to +55 °C / T5 = -40 to +70 °C / T4 = -40 to +85 °C                                           |
| Temp. range in “II 1 G”                                                          | T6 = -20 to +40 °C / T5 = -20 to +50 °C / T4 = -20 to +60 °C                                           |
| Supply circuit<br>Max. value at the terminals<br>1(+) and 2(-)                   | U <sub>i</sub> = 30 VDC<br>I <sub>i</sub> = 100 mA<br>P <sub>i</sub> = 750 mW                          |
| Internal inductance<br>and capacitance                                           | L <sub>i</sub> = negligible<br>C <sub>i</sub> = negligible                                             |
| Sensor circuit<br>Max. values at the terminals<br>3, 4, 5 and 6                  | U <sub>o</sub> = 5 V DC<br>I <sub>o</sub> = 5.4 mA<br>P <sub>o</sub> = 6.6 mW<br>linear characteristic |
| Internal inductance<br>and capacitance                                           | L <sub>i</sub> = negligible<br>C <sub>i</sub> = negligible                                             |
| Connected circuit <b>without</b> lumped<br>external inductance<br>or capacitance | L <sub>o</sub> = 1000 mH<br>C <sub>o</sub> = 100 µF                                                    |
| Connected circuit <b>with</b> lumped<br>external inductance<br>or capacitance    |                                                                                                        |
| Ex ia IIC<br>Ex ia IIB, Ex ia IIA                                                | L <sub>o</sub> = 100 mH / C <sub>o</sub> = 2 µF<br>L <sub>o</sub> = 100 mH / C <sub>o</sub> = 9.9 µF   |

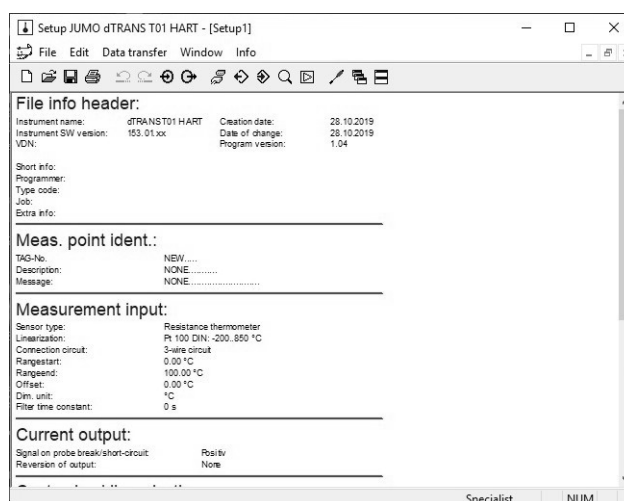
**Approvals/marks of conformity**

| Mark of conformity                                           | Testing laboratory | Certificates/<br>certification numbers | Test basis                                                                           | valid for       |
|--------------------------------------------------------------|--------------------|----------------------------------------|--------------------------------------------------------------------------------------|-----------------|
| II 1 G Ex ia IIC T6-T4 Ga                                    | ZELM Ex            | ZELM 99 ATEX 0018 X                    | EN 60079-0:2012 + A11:2013<br>EN 60079-11:2012<br>EN 60079-26:2007<br>EN 1127-1:2011 | Type 707015/... |
| Ex ia IIC T6...T4 Ga                                         | Primara            | IECEx ZLM 14.0011X                     | IEC 60079-0:2011 (ed. 6)<br>IEC 60079-11:2011 (ed. 6)<br>IEC 60079-26:2006 (ed. 2)   | Type 707015/... |
| II 1 G Ex ia IIC<br>T6/T5/T4<br>II 2 G Ex ia IIC<br>T6/T5/T4 | PTB                | PTB 01 ATEX 2124                       | EN 60079-0:2012 + A11:2013<br>EN 60079-11:2012<br>EN 60079-26:2015                   | Type 707016/... |

**Setup program**

The setup program is available for configuring the transmitter from a PC. With Types 707014/... and 707015/... , the connection is via the PC interface with a an USB/TTL converter and the setup interface of the transmitter, in the case of Types 707011/..., 707013/... and 707016/..., via a HART® modem. The connection for the setup circuit must only be used outside the hazardous area. It is not permissible to configure the transmitter inside the Ex area.

The protective cover must be closed after programming type 707015/... .

**Configurable parameters**

|                                                                                                                                                  |                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| TAG number (10 characters)<br>on Types 707011/..., 707013/... and 707016/..., 8 characters only,<br>but with additional 16-character description | Sensor type                                                                             |
| Connection circuit (2-/3-/4-wire)                                                                                                                | External and internal cold junction                                                     |
| Customized linearization (not for type 707014/...)                                                                                               | Range limits                                                                            |
| Output signal rising/falling (reversion)                                                                                                         | Digital filter                                                                          |
| Response to probe break/short circuit                                                                                                            | Recalibration/fine calibration<br>(not for Types 707011/..., 707013/... and 707016/...) |
| Lead resistance with 2-wire circuit                                                                                                              |                                                                                         |

If no power supply (supply isolator) is available, the 2-wire transmitter Type 707014/... or 707015/... has to be configured using a 9V block battery as a power source.

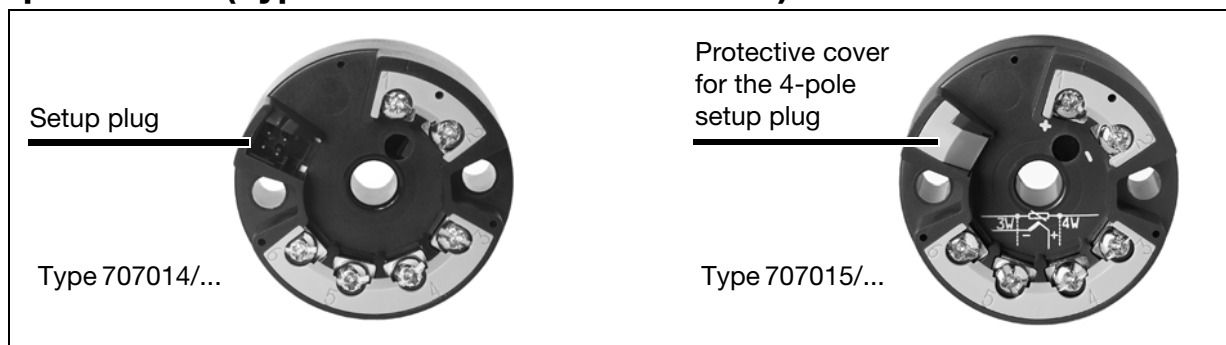
**Fine calibration (not on Types 707011/..., 707013/... and 707016/...)**

Fine calibration means correction of the output signal. The signal can be adjusted within  $\pm 5\%$  of the 20 mA full-scale value. Fine calibration is performed through the setup program. Values for 4 mA (zero), 20 mA (full scale) and offset can be calibrated separately, via the setup program.

**Hardware and software requirements**

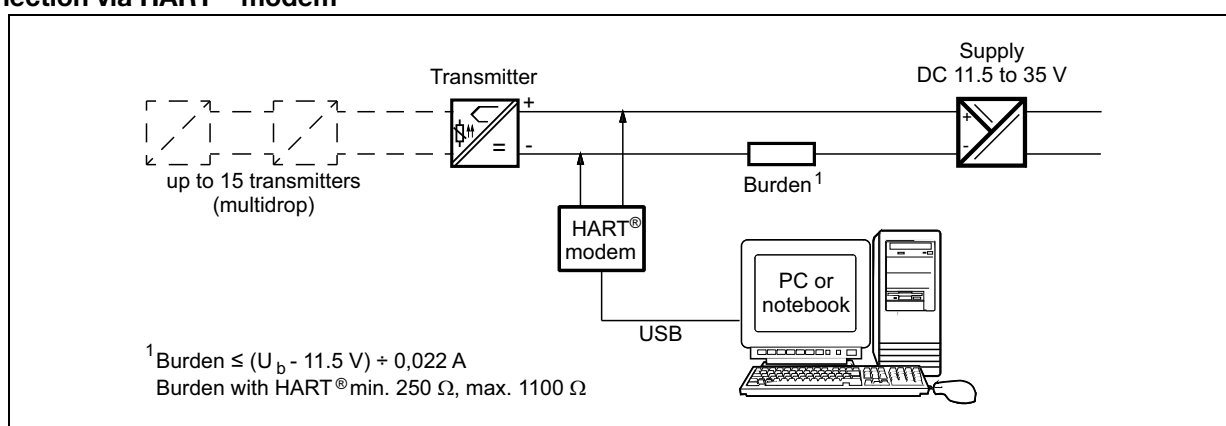
A PC with a serial interface or USB interface (e.g. HART® modem) is required to install and use the setup program. Details about supported operating systems (Microsoft® Windows®), required hard disk drives, and memory can be found under information about the setup program on the manufacturer's website.

## Setup interface (Types 707014/... and 707015/...)



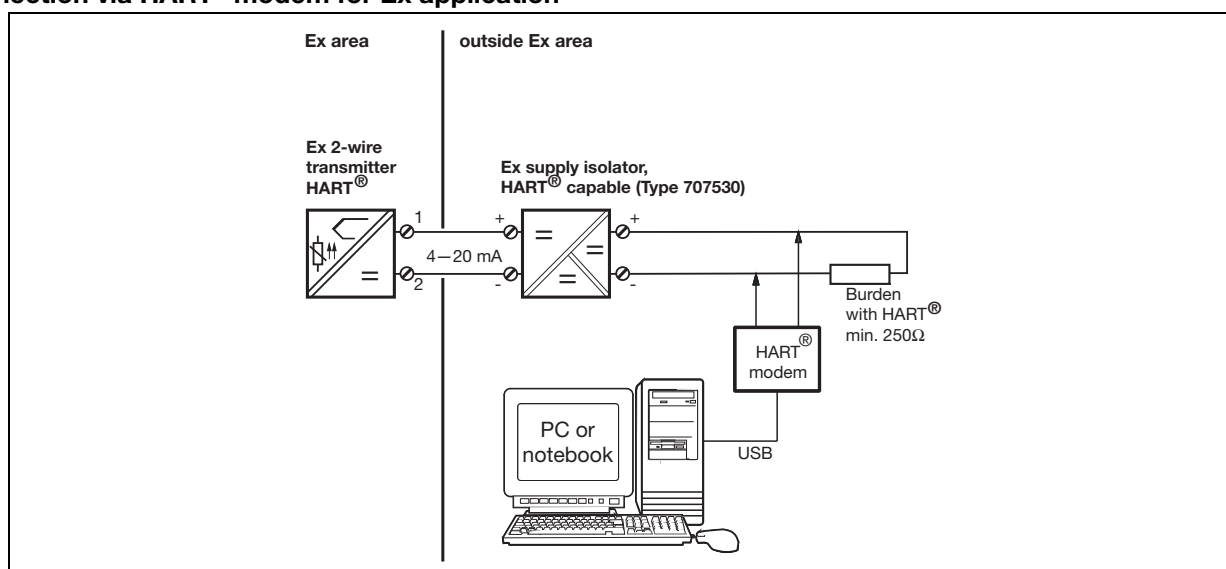
## HART<sup>®</sup> interface (Type 707011/... and 707013/...)

### Connection via HART<sup>®</sup> modem



## HART<sup>®</sup> interface (Type 707016/...)

### Connection via HART<sup>®</sup> modem for Ex application



## Connection diagram

Setup

Type 707011/..., Type 707015/...,  
Type 707016/...

Type 707014/...

## Connection for

Supply voltage  
for Type 707011/...  
11.5 ... 35V DC

Supply voltage  
for Type 707014/...  
8 ... 35V DC

Supply voltage  
for Type 707015/...  
8 ... 30V DC (Ex)<sup>a</sup>

Supply voltage  
for Type 707016/...  
11.5 ... 30V DC (Ex)<sup>a</sup>

Current output  
4 – 20 mA

## Terminals

$$+1 \quad R_B = \frac{U_b - 11.5V}{22mA}$$

$$-2 \quad R_B = \frac{U_b - 8V}{22mA}$$

$$R_B = \frac{U_b - 8V}{22mA}$$

$$R_B = \frac{U_b - 11.5V}{22mA}$$

$R_B$  = burden resistance  
 $U_b$  = supply voltage

Ex version only in conjunction with certified Ex transmitter supply unit

## Analog inputs

Thermocouple

+4  
-6

RTD temperature probe  
in 2-wire circuit

3  $R_L \leq 11 \Omega$   
6  $R_L = \text{lead resistance}$   
per conductor

RTD temperature probe  
in 3-wire circuit

3  $R_L \leq 11 \Omega$   
5  $R_L = \text{lead resistance}$   
6  $R_L = \text{lead resistance}$   
per conductor

RTD temperature probe  
in 4-wire circuit

3  $R_L \leq 11 \Omega$   
4  $R_L = \text{lead resistance}$   
5  $R_L = \text{lead resistance}$   
6  $R_L = \text{lead resistance}$   
per conductor

Ex version: please note connection data of the Ex input circuit!

<sup>a</sup> On types 707015/... and 707016/... only up to 30V. The connection must only be made to an intrinsically safe circuit.

| <p>61</p> <p>22.5</p> <p>Depth behind panel<br/>98 max.</p> | Connection for |                                                                                                                                                                      | Terminals                                           |  |
|-------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--|
|                                                             |                | Supply voltage<br>for Type 707013/...<br>11.5 — 35 V DC                                                                                                              | +81 $R_B = \frac{U_b - 11.5V}{22mA}$<br>-82         |  |
|                                                             |                | Current output<br>4 — 20 mA                                                                                                                                          | $R_B$ = burden resistance<br>$U_b$ = supply voltage |  |
|                                                             | Analog inputs  |                                                                                                                                                                      |                                                     |  |
|                                                             |                | Thermocouple<br>(special feature: see<br>order details)                                                                                                              | +11<br>-12                                          |  |
| RTD temperature probe<br>in 2-wire circuit                  |                | 11 $R_L \leq 11 \Omega$<br>13 $R_L$ = lead resistance<br>per conductor                                                                                               |                                                     |  |
| RTD temperature probe<br>in 3-wire circuit                  |                | 11 $R_L \leq 11 \Omega$<br>12 $R_L$ = lead resistance<br>per conductor<br>13 $R_L$ = lead resistance<br>per conductor                                                |                                                     |  |
| RTD temperature probe<br>in 4-wire circuit                  |                | 11 $R_L \leq 11 \Omega$<br>12 $R_L$ = lead resistance<br>per conductor<br>13 $R_L$ = lead resistance<br>per conductor<br>14 $R_L$ = lead resistance<br>per conductor |                                                     |  |

Caution: the order details on P. 9 must be observed



## Order details: JUMO dTRANS T01 / T01T

### Programmable 2-wire transmitter

#### (1) Basic type

|           |                                                                                                                                                                 |                                                                                                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 707011    | dTRANS T01 B HART®<br>programmable 2-wire transmitter with HART® interface                                                                                      |                                                                                                                                                                         |
| 707013    | dTRANS T01 T HART<br>programmable 2-wire transmitter with HART interface<br>installed in rail mounting housing <sup>a</sup><br>(Caution: observe the footnotes) |                                                                                                                                                                         |
| 707014    | dTRANS T01 Junior                                                                                                                                               |                                                                                                                                                                         |
| 707015    | dTRANS T01 B Ex<br>programmable 2-wire transmitter with Ex protection                                                                                           |   |
| 707016    | dTRANS T01 B Ex HART®<br>programmable 2-wire transmitter with HART® interface<br>and Ex protection                                                              |                                                                                      |
| x x x x x | <b>(2) Input (programmable)</b><br>888 factory-set (Pt100 DIN 4w / 0 ... 100 °C)<br>999 configuration to customer specification <sup>b</sup>                    |                                                                                                                                                                         |
| x x x x x | <b>(3) Output (proportional DC current)</b><br>888 factory-set (4 — 20 mA)<br>999 configuration to customer specification (20 ... 4 mA)                         |                                                                                                                                                                         |
| x x x x x | <b>(4) Probe break/ short circuit</b><br>888 factory-set (positive protection)<br>999 configuration to customer specification (negative protection)             |                                                                                                                                                                         |
| x x x x x | <b>(5) Extra codes</b><br>000 none<br>243 transmitter in surface-mounting case                                                                                  |                                                                                                                                                                         |

Order code

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| (1)                  | (2)                  | (3)                  | (4)                  | (5)                  |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Order example

707010 / 888 - 888 - 888 / 243

<sup>a</sup> When ordering, please specify the type of sensor required (thermocouple or RTD temperature probe). For thermocouple inputs, the sensor input cannot be changed retrospectively, because of the internal compensating cable. For RTD temperature probe inputs, all types of RTD temperature probes listed on P. 2 can be connected, but no thermocouples. Thermocouple inputs are available on request.

<sup>b</sup> Probe type and range have to be specified in plain text for configuration to customer specification.

## Standard accessories

- 1 Operating Instructions
- Fixing items: 2 fastening screws, 2 compression springs, and 2 locking washers (not for Type 707013/...)

## Accessories

- PC setup program, multilingual
- PC interface with USB/TTL converter, adapter (socket) and adapter (pins) for Types 707014/... and 707015/...
- Bracket for mounting on DIN rail, part no. 00352463
- HART® modem USB (for Types 707011/..., 707013/... and 707016/...), part no. 00443447
- Power supply units 1- and 4-way (Data Sheet 707500)
- Ex-i power supply/input isolating amplifier (Data Sheet 707530), part no. 00577948