Transokomp 350

Multipoint data recorder

Fast recording of 30 measured values and 30 calculated values in 2 seconds

Universal input channels with free allocation of sensor types

Ten colours for simplified evaluation

Easy, interactive programming

Data storage on 3,5-inch floppy disk

Versatile mathematical functions

Several alarm types with up to 12 relays

Interfaces: RS 422A / RS 485, RS 232C

PROFILE

Transokomp 350 is a configurable, microprocessor-controlled multipoint data recorder for up to 30 channels. Connection of thermocouples, resistive sensors and voltage transducers is direct, whereas current signals are connected via external shunts. Measuring ranges and sensor types can be configured easily via the built-in key panel.

DESCRIPTION

Fast scanning and recording

The raster-scan method and the improved dot-matrix printing system permits recording of max. 30 channels plus 30 additional calculated values in 2 seconds. This simultaneous recording optimizes the accuracy and ensures reliable data analysis.

10-colour recording

In addition to the 6 standard (DIN) colours, recording clarity and evaluation are improved by further 4 colours (navy blue, yellow-green, red-purple, orange).

Easy operation

Adjustment of recording parameters is simplified by the interactive menu-guidance feature. Ink ribbon replacement is done in three simple steps.
The folded chart with its two border zones for supplementary numeric records is informative and easy to evaluate.

A vacuum-fluorescent display with 3 lines and internal lighting ensures excellent data readability at all times.

Data storage

For data storage there is a 3,5-inch floppy disk. Programs and recorded data can be stored, whereby storage can be triggered by various external events, e.g. alarms, chart-end, external contact, etc. This practically prevents any loss of data.

Mathematical functions

For optimizing data evaluation, the following optional arithmetic functions are available: basic arithmetic modes, square rooting, min/max, mean value, absolute value, standard deviation, deviation, etc. With these functions, Transokomp 350 can execute analyses for which other recorders require a separate computer.

Wide range of input signals

The input signals can be DC voltage or current, thermocouples, resistance thermometers, and logic signals.

Versatile printing formats

Printing is possible in analog (trend), analog/digital, and logger format. Selection of the required print function, e.g. range print-out, partial compression, info-line, scaling, and TAG no. permits a printed record which can be tailored for the individual application.

Alarm functions

The various alarm types include limit value alarms, difference alarms (Δt), and rate of change alarms in both directions. Up to 4 alarm levels are adjustable per channel, which ensures highly efficient monitoring, especially with complex processes and production lines.

Numerous options

- remote control
- max. 12 alarm relays
- interfaces (RS 232/RS 422/RS 485)
- internal illumination

TECHNICAL DATA

INPUT

Number of input channels
10, 20 or 30, depending on version.
Free allocation of input signal type to any channel.

Scanning interval
For measuring all channels, adjustable 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 seconds

A/D converter
Resolution: 14 bits
Integration time:
20 ms with 50 Hz, or 16,7 ms with 60 Hz, or 100 ms with 50/60 Hz (only with recording interval ≧ 6 seconds)

Input resistance
> 10 MΩ for thermocouples and ranges up to 2 V;
1 MΩ for ranges > 2 V

Source resistance
< 2 kΩ for voltage ranges
< 10Ω per lead with Pt 100 input

Input leakage current
< 10 nA

Thermocouple break monitoring
Sensor current approx. 4 µA
TC break is signalled when R_{in} > 100kΩ

Cold-junction compensation
Internal or external, configurable for each channel.
Error of CJC:
1K with types R, S, W, B;
0,5K with types K, J, E, T, N, L, U

Permissible overload
Max. 10 VDC with input ranges ≦ 2 V
Max. 6 VDC with input ranges > 2 V

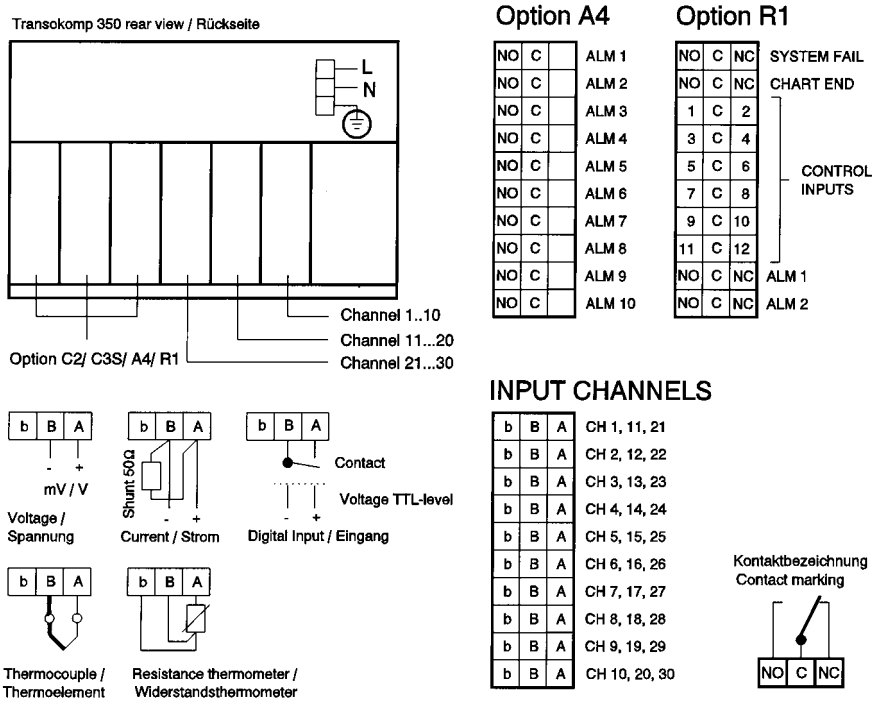
Effect of ambient temperature
On span: 0,01%/K
On span start: 0,01%/K

Interference effects at input

Common mode
Voltage: < 250 VAC
Suppression: 120 dB (50/60 Hz)

Series mode
Voltage: < 1,2 x input span
Suppression: 40 dB (50/60 Hz)

Fig. 1 Connecting diagram



Measuring ranges, errors, and resolution
Free allocation of signal type to each input channel

Signal type	Measuring limits	Error [4]	Resolution
Direct voltage			
20mV	– 20,00 to 20,000mV	± 0,05 % ± 5digits	1µV
60mV	– 60,00 to 60,000mV	± 0,05 % ± 2digits	10µV
200mV	– 200,0 to 200,00mV	± 0,05 % ± 2digits	10µV
2 V	– 2,000 to 2,0000 V	± 0,05 % ± 2digits	100µV
6 V	– 6,00 to 6,000 V	± 0,05 % ± 2digits	1mV
20 V	– 20,00 to 20,000 V	± 0,05 % ± 2digits	1mV
50 V	– 50,0 to 50,00 V	± 0,05 % ± 2digits	10mV
Thermocouples[1]			
R Pt13 %Rh-Pt	0 to 1760,0 °C	± 0,05 % ± 1 K[3]	0,1 K
S Pt10 %Rh-Pt	0 to 1760,0 °C	± 0,05 % ± 1 K[3]	0,1 K
B Pt13 %Rh-Pt6 %Rh	400 to 1820,0 °C	± 0,05 % ± 1 K[3]	0,1 K
K NiCr-Ni	– 200 to 1370,0 °C	± 0,05 % ± 0,7 K	0,1 K
E NiCr-CuNi	– 200 to 800,0 °C	± 0,05 % ± 0,5 K	0,1 K
J Fe-CuNi	– 200 to 1100,0 °C	± 0,05 % ± 0,7 K	0,1 K
T Cu-CuNi	– 200 to 400,0 °C	± 0,05 % ± 0,5 K	0,1 K
L Fe-CuNi	– 200 to 900,0 °C	± 0,05 % ± 0,7 K	0,1 K
U Cu-CuNi	– 200 to 400,0 °C	± 0,05 % ± 0,7 K	0,1 K
N NiCr Si-NiSi	0 to 1300,0 °C	± 0,05 % ± 0,7 K	0,1 K
W W5 %Re-W26 %Re	0 to 2315,0 °C	± 0,05 % ± 1 K	0,1 K
Resistance thermometer[2] [5]			
Pt100 (1mA)	– 200 to 600,0 °C	± 0,05 % ± 0,3 K	0,1 K
Pt100 (1mA)	– 140 to 150,00 °C	± 0,05 % ± 0,3 K	0,01 K
Ni100 (1mA)	– 60 to 180,0 °C	± 0,05 % ± 0,3 K	0,1 K

Direct current
0...20 mA ≙ 0,000...1,000 V via shunt resistor 50 Ω
4...20 mA ≙ 0,200...1,000 V via shunt resistor 50 Ω
One shunt resistor required per current input, see "Accessories"

Digital signals TTL-OFF: < 2,4 V; ON: > 2,6 V
contact ON / OFF (potential free)

1) Types R, S, B, K, E, J, T, N to DIN IEC 584; types L and U to DIN 43 710; type W "Hoskins".
2) Pt100 to DIN IEC 751; Ni100 to DIN 43 760
3) Not specified in the range 0...600 °C.
4) In % of displayed value.

Standard calculation functions

Scaling
All measuring ranges can be converted into any span between -30000 and +30000 (decimal point in any position)

Difference calculation
Between any pair of channels with equal measuring ranges

Moving average
Average of last 2...64 scan cycles

Partial compression
For a definable part of the measuring range (1 break point)

RECORDING

Recording method
Wire-dot printer with 10-colour ink ribbon cassette

Chart paper
Z-fold chart, 30 m long
Recording width for analog (trend) record: 250 mm

Recording colours
For analog (trend) recording, one of the following colours can be assigned to each channel: black, light blue, navy blue, green, yellow-green, red-purple, brown, orange, red, and purple.
Numeric data: black
Alarm ON: red
Alarm OFF: blue
Listing: purple

Recording error
Measurement error +0,1% of the effective recording span

Printing formats
- Analog (trend) record
- Analog (trend) record with numeric print-out on left border
- numeric printing (logging)

Chart speed
Configurable 1...1500 mm/h

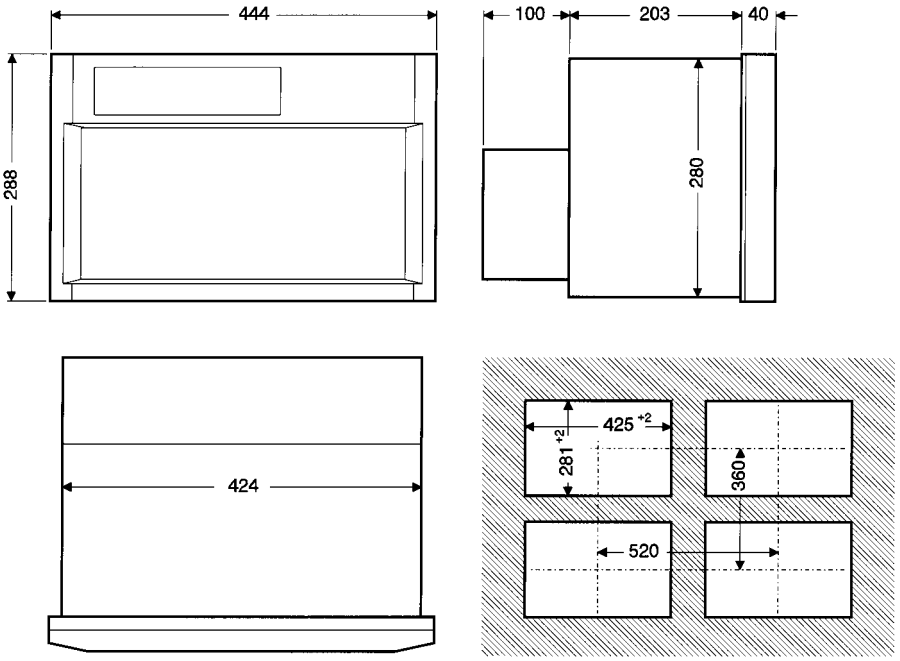
Chart speed error
≦ 0,1%

Switch-over to second chart speed
Via an external contact (Option R1) or in case of an alarm

Print interval
Automatic, as a function of chart speed, or fixed according to scanning interval

Recording width
Normal: 0...250 mm for each channel.
Span start configurable 0...245 mm; span configurable 5...250 mm

Fig. 2 Overall dimensions



Print modes
- normal
- start recording on alarm
- start/stop recording at selectable times
- change chart speed on alarm or via external contact (Option R1)

Additional print functions
- engineering unit (6 characters)
- TAG number (instead of channel number)
- alarms on right-hand border (channel no., type of alarm, on/off time)
- 12 messages (16 characters each)
- cyclical scale marking every 20%
- header (5 lines with 80 characters each)
- manual mode for a numeric print-out with date and time (analog recording is interrupted)
- program listing
- interpolation (with step changes of the input signal, the recorded points are connected by a line)

DISPLAY AND OPERATION

Display type
Vacuum-fluorescent (5 x 7 dot matrix), 3 lines.
Line 1: 22 characters, 10 mm high
Lines 2 & 3: 40 characters, 5 mm high

Displayed data
Channel no., TAG no., alarm status, measured value (numeric), engineering unit, measured value (analog bargraph), time, alarm-relay status, battery status, recording mode.

Operating keys
For operation and configuration of the recorder, guided dialog, supported by the display.

ALARMS

Alarm levels
up to 4 levels per channel

Alarm modes
Upper / lower limit (H / L)
Upper / lower difference (dH / dL)
Upper / lower rate of change (RH / RL)
Time span for rate of change is configurable between 2 and 15 scanning cycles.

Alarm recording
On right-hand border of chart: channel no., alarm mode, on/off times of alarm (message texts can be assigned).

Alarm outputs
2 or 2+10 output relays, freely assignable to the input channels and alarm levels. For further details, see Options R1/A4.

OPTIONS

Data storage

3,5-inch disk drive
For 2HD and 2DD floppy disks.
Capacity: 1,2 Mbyte, 1,44 Mbyte, 720 kbyte
Buffer: on-board 1 Mbyte (DRAM). Data are held in the buffer before saving on disk.
Buffer back-up time: 1 minute in case of mains failure

Function:
Storage of adjustment parameters, measurement values, and calculated values.
Data length: 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k of measurement values per channel
Storage interval: same as scanning interval or 1, 2, 5 or 10 minutes
Data format:
Binary data: 2 bytes per measured value
ASCII data: 10 bytes per calculated value

Include conversion software on 3,5" Floppy

Option Type R1
Control inputs / Relay outputs

Control inputs
- start/stop of recording
- start manual print-out
- switch-over to second chart speed
- start/stop of statistical computing functions
- start data storage

Relay outputs
- 2 output relays for alarms
- relay for „End of chart"
- relay for „System error"

All relays with one change-over contact rated at 250 VAC / 2 A; 250 VDC / 0,1 A; or 30 VDC / 2 A (resistive load)

Option Type A4
Alarm output relays
10 alarm output relays, each with one normaly open contact rated at:
250 VAC / 2 A; 250 VDC / 0,1 A; or 30 VDC / 2 A (resistive load)

Option Type M1
Mathematical module

Mathematical functions
Basic arithmetic modes (+, –, *, /), Square rooting (SQR), Exponent (EXP), common logarithm (LOG), absolute value (ABS)

Statistical computing functions
Minimum value (MIN), Maximum value (MAX), Mean value (AVE), Sum (SUM)

Logic functions
AND, OR, NOT, XOR

Number of mathematical channels: 30
Computation range: 10^{+38}
Display range: from –9 999 999 up to +9 999 999 (decimal point in any position)

Option Types C2 and C3S
RS 232 C interface
RS 422A / RS 485 interface
Functions:
Input/output of measured data
Input/output of limit values
Programming and remote control
Specification: based on EIA standard
Connection: point-to-point
Communication:
RS 232C: half duplex
RS 422A / RS 485: half duplex, four leads
Synchronization: with start/stop bits

Transmission speed:
150, 300, 600, 1200, 2400, 4800, 9600, 19.200 bits/s
Start bit: 1 bit fixed
Data length: 7 or 8 bits
Parity: even, odd, or none
Stop bit: 1 or 2
Transmission distance:
RS 232C: max. 15 m
RS 422A / RS 485: max. 500 m
Connection:
RS 232C: 25-pin D-type connector
RS 422A / RS 485: 6 screw terminals

ENVIRONMENTAL CONDITIONS

For operation
Supply voltage: 90...250 VAC
Frequency: 50/60 Hz ± 2%
Temperature: 0...50 °C
Relative humidity: 20...80%
Vibration: 10...60 Hz, < 4,9m/s²
Shock: not permitted
Magnetic field strength: max. 400 A/m
Mounting position: front vertical, max. rear inclination 30°
Warm-up time: 30 minutes

For storage and transport
Temperature: –25...60 °C
Relative humidity: 5...95%
Vibration: 10...60 Hz, < 4,9m/s²
Shock: < 392 m/s² in original packing

CONFORMITY TESTS

The instrument has CE-marking.

Electrical safety
According to IEC 1010

Test voltages
Between mains supply terminals and housing: 1500 VAC
Between input/output terminals and housing: 1000 VAC
Insulation resistance: > 20 MΩ (with 500 V) between all input/output terminals and housing

Electro-magnetic compatibility
EMI: EN 55 011, Group 1, Class A
EMC: IEC 801

POWER SUPPLY

Supply voltage
90...250 VAC, 50/60 Hz

Power consumption
Approx. 70 VA

GENERAL

Housing
For panel mounting, sheet steel, grey finish. For dimensions, see Fig. 2.

Protection mode
Front: IP 54
Terminals: IP 20

Electrical connections
Screw terminals

Data security
Battery back-up (lithium), including clock function.
Battery life approx. 10 years.

Weight
Approx. 15 kg

TRANSOKOMP 350

Versions		Order no.
10 input channels		**9404 300 1 . 001**
20 input channels		**9404 300 2 . 001**
30 input channels		**9404 300 3 . 001**
Inputs	**Data storage**	↑
Universal U/TC/RTD/DI	None	**1**
	3,5-inch disk drive	**2**
Standard U/TC/DI	None	**4**
	3,5-inch disk drive	**5**

OPTIONS

(Order separately, will be fitted into recorder, not available as individual modules)

Description	Type	Order no.
Mathematics module	M1	**9404 300 00201**
RS 232 C interface [1] [2]	C2	**9404 300 00211**
RS 422 A / RS 485 interface [1] [2]	C3S	**9404 300 00221**
10 alarm relays [2]	A4	**9404 300 00231**
Control inputs/relay outputs [2]	R1	**9404 300 00241**
Chart illumination	H1	**9404 300 00251**
Temperature display in °F	D2	**9404 300 00271**

[1]) Only one interface per unit
[2]) Max 3 modules per instrument

CONSUMABLES

10-colour ink ribbon cassette	**4012 027 45498**
Z-fold chart, 30 m long	**4012 027 45497**

ACCESSORIES

Certificate (original calibration)	**9404 300 00301**
50 Ω ± 0,1% shunt resistor	**4012 151 57322**

PMA
Prozeß- und Maschinen-
Automation GmbH
P.O. Box 31 02 29
D-34058 Kassel
Tel.: +49 - 561 - 505 13 07
Fax: +49 - 561 - 505 17 10
e-mail: mailbox@pma-online.de
Internet: http://www.pma-online.de

Your local representative:

Printed in Germany – Edition 9801 · Data subject to alteration without notice · 9498 737 28913

G960061