

3. ALMEMO® Sensors

ALMEMO® instruments use approximately 65 measuring ranges to allow an even larger number of sensors to be directly connected. Accurate measuring data can be read immediately with no instrument settings required. All standard sensors with ALMEMO® connectors usually come pre-programmed with measuring range, dimension and also scaling data if required. The relevant measuring channels will be automatically activated and properly set by the sensor. A mechanical coding ensures that sensors and output modules can, only with the correct orientation, be connected to the correct sockets. A cold junction compensation for the thermocouple measurement has already been integrated. The use and operation of the sensors and the connection of existing sensors will be described in detail in the following sections.

3.0 Overview

Sensor	Sensor Type Order No.	ALMEMO® Connector Type	Order No.	Abbr.	Dim
Resistance-based temp. sensors:					
Pt100-1 4-conductor	FP Axxx	normal	ZA 9030-FS1	P104	°C
Pt100-2 4-conductor	FP Axxx	normal	ZA 9030-FS2	P204	°C
Pt 1000 -1 4-conductor			ZA 9030-FS4	P104	°C
Pt 1000 -2 4-conductor			ZA 9030-FS5	P204	°C
Ni100 4-conductor		normal	ZA 9030-FS3	N104	°C
Ni 1000 4-conductor			ZA 9030-FS6	N104	°C
Ntc type N	FN Axxx	normal	ZA 9040-FS	Ntc	°C
2 x NTC type N			ZA 9040-FS2	Ntc	°C
NTC type N 0,001K*		normal	ZA 9040-FS3	Ntc3	°C
KTY 84 *		normal	ZA 9040-FS4	KTY	°C
YSI 400 *			ZA 9641-FS	NtcY	°C
Thermocouples:					
NiCr-Ni (K)	FT Axxx	thermo	ZA 9020-FS	NiCr	°C
NiCr-Ni (K) Measuring module	electric. isolated	module	ZA 9920 AB	DIGI	°C
NiCroSil-Nisil (N)		thermo	ZA 9020-FSN	NiSi	°C
Fe-CuNi (L)		normal	ZA 9000-FSL	FeCo	°C
Fe-CuNi (J)		normal	ZA 9000-FSJ	IrCo	°C
Cu-CuNi (U)		normal	ZA 9000-FSU	CuCo	°C
Cu-CuNi (T)		normal	ZA 9000-FST	CoCo	°C
PtRh10-Pt (S)	FS Axxx	normal	ZA 9000-FSS	Pt10	°C
PtRh13-Pt (R)		normal	ZA 9000-FSR	Pt13	°C
PtRh30-PtRh6 (B)		normal	ZA 9000-FSB	EL18	°C
AuFe-Cr		normal	ZA 9000-FSA	AuFe	°C
W5Re - W26Re (C)*		normal	ZA 9000-FSC	Ur26	°C
Heat flow W/m ²	FQ Axxx	normal	ZA 9007-FS	mV 2	W/m
DC voltage:					
55 Millivolt DC		normal	ZA 9000-FS0	mV	mV
26 Millivolt DC		normal	ZA 9000-FS1	mV 1	mV
260 Millivolt DC		normal	ZA 9000-FS2	mV 2	mV
2.6 Volt DC		normal	ZA 9000-FS3	Volt	V
26 Volt DC		divider	ZA 9602-FS	Volt	V
2 x 26 Volt DC (without electr. isolat.)		divider	ZA 9602-FS2	Volt	V

Sensor	Sensor Type Order No.	ALMEMO® Type	Connector Order No.	Abbr.	Dim
Differential measurement: sensor supply 7..9V					
Differential 55 Millivolt DC		normal	ZA 9000-FS0D	D 55	mV
Differential 26 Millivolt DC		normal	ZA 9000-FS1D	D 26	mV
Differential 260 Millivolt DC		normal	ZA 9000-FS2D	D260	mV
Differential 2.6 Volt DC		normal	ZA 9000-FS3D	D 2.6	V
Differential amplifier for meas. bridge: sensor supply 5V stable					
Differential 55 Millivolt DC		bridge	ZA 9650-FS0	D 55	mV
Differential 26 Millivolt DC gain=10		bridge	ZA 9650-FS1V	D260	mV
Differential 260 Millivolt DC gain=10		bridge	ZA 9650-FS2V	D 2.6	mV
Differential 2.6 Volt DC		bridge	ZA 9650-FS3	D 2.6	mV
Differential measurement: sensor supply with DC/DC 12V					
Differential 55 Millivolt DC		V12	ZA 9600-FS0V12	D 55	mV
Differential 26 Millivolt DC		V12	ZA 9600-FS1V12	D 26	mV
Differential 260 Millivolt DC		V12	ZA 9600-FS2V12	D260	mV
Differential 2.6 Volt DC		V12	ZA 9600-FS3V12	D 2.6	V
Differential 26 Volt DC		V12 divider	ZA 9602-FS3V12	D 2.6	V
Fast, overload-proof DC meas. module with electr. isol. 4kV:					
2.0 Volt DC 1kHz		module	ZA 9900-AB2	DIGI	V
20 Volt DC 1kHz		module	ZA 9900-AB3	DIGI	V
200 Volt DC 1kHz		module	ZA 9900-AB4	DIGI	V
400 Volt DC 1kHz		module	ZA 9900-AB5	DIGI	V
DC current:					
32 Milliampere DC		Shunt	ZA 9601-FS1	mA	mA
Percent (4-20mA DC)		Shunt	ZA 9601-FS2	%	%
2 x 32 Milliampere DC (without electr. isolation)		Shunt	ZA 9601-FS3	mA	mA
2 x percent (4-20mA DC) (without electr. isolation)		Shunt	ZA 9601-FS4	%	%
Differential measurement: sensor supply 7..9V					
Differential 32mA		Shunt	ZA 9601-FS5	mA	mA
Differential percent		Shunt	ZA 9601-FS6	%	%
Differential measurement: sensor supply with DC/DC 12V					
Differential 32mA		V12Shunt	ZA 9601-FS5V12	mA	mA
Differential % (4-20%)		V12Shunt	ZA 9601-FS6V12	%	%
Fast, overload-proof DC meas. module with electr. isol. 4kV:					
20 mA DC 1kHz		module	ZA 9901-AB1	DIGI	mA
200 mA DC 1kHz		module	ZA 9901-AB2	DIGI	mA
2 Amp. DC 1kHz		module	ZA 9901-AB3	DIGI	A
10 Amp. DC 1kHz		module	ZA 9901-AB4	DIGI	A
Resistance:					
500 Ohm		normal	ZA 9003-FS	Ohm	W
5000 Ohm		normal	ZA 9003-FS2	Ohm	W
AC voltage:					
260 Millivolt AC without electr. isolat.		cable	ZA 9603-AK1	mV 2	mV
2.6 Volt AC without electr. isolation		cable	ZA 9603-AK2	Volt	V
26 Volt AC without electr. isolation		cable	ZA 9603-AK3	Volt	V
Fast, overload-proof AC meas. module with electr. isol. 4kV:					
130 Millivolt AC TRMS		module	ZA 9903-AB1	DIGI	mV
1.3 Volt AC TRMS		module	ZA 9903-AB2	DIGI	V
13 Volt AC TRMS		module	ZA 9903-AB3	DIGI	V
130 Volt AC TRMS		module	ZA 9903-AB4	DIGI	V
400 Volt AC TRMS		module	ZA 9903-AB5	DIGI	V

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AC current: Fast, overload-proof AC meas. module with electr. isol. 4kV:					
1 Amp. AC TRMS		module	ZA 9904-AB1	DIGI	A
10 Amp. AC TRMS		module	ZA 9904-AB2	DIGI	A
Digital signals:					
Frequency		cable	ZA 9909-AK1U	Freq	Hz
Revolutions/min		cable	ZA 9909-AK4U	Freq	Um
Pulses/measuring cycle		cable	ZA 9909-AK2U	PULS	
Digital inputs		cable	ZA 9000-EK2	Inp	%
Digital interface		cable	ZA 9919-AKxx	DIGI	%
Infrared sensors:					
Infrared1 0...200°C	FI A628-1/5	normal	ZA 9008-FS1	Ir 1	°C
Infrared4 -30...+100°C	FI A628-4	normal	ZA 9008-FS4	Ir 4	°C
Infrared6 0...500°C	FI A628-6	normal	ZA 9008-FS6	Ir 6	°C
Cap. humidity sensors with Ntc:					
1. Temperature Ntc type N	FH A646	normal	ZA 9046-FS	Ntc	°C
2. Rel. humidity				% rH	%H
x. Dew point temperature				H DT	°C
x. Mixture ratio with PC				H AH	gk
x. Partial vapour pressure				H VP	mb
x. Enthalpy with PC				H En	kJ
1. Temperature Ntc type N	FH A646-C			Ntc	°C
2. Rel. humidity with TC				HcrH	%H
1. Temperature Ntc type N	FH A646-R			Ntc	°C
2. Rel. humidity with TC Ø 5mm				H rH	%H
Cap. humidity sensor with NiCr-Ni:					
1. NiCr-Ni (K)		thermo	ZA 9026-FS	NiCr	°C
2. Rel. humidity				% rH	%H
Psychrometer:					
1. Ntc type N	FN A846	cable	ZA 9846-AK	Ntc	°C
2. Rel. humidity with PC				P RH	%H
x. Dew point temperature with PC				P DT	°C
x. Mixture ratio with PC				P AH	gk
x. Enthalpy with PC				P En	kJ
x. Partial vapour pressure with PC				P VP	mb
x. Humid temperature				P HT	°C
Moisture sensor for materials					
1. Moisture construction materials	FH A696-MF	normal		D2.6	B%
2. Moisture wood				D2.6	H%
x. Moisture paper				D2.6	P%
Rotating vanes:					
Snap-on head normal 20 m/s	FV A915-S120	cable	ZA 9915-AKS1	S120	m/s
Snap-on head normal 40 m/s	FV A915-S140	cable	ZA 9915-AKS2	S140	m/s
Snap-on head micro 20 m/s	FV A915-S220	cable	ZA 9915-AKS3	S220	m/s
Snap-on head micro 40 m/s	FV A915-S240	cable	ZA 9915-AKS4	S240	m/s
Macro 20 m/s	FV A915-SMA1	cable	ZA 9915-AK5	L420	m/s
Water micro 5 m/s	FV A915-WM1	cable	ZA 9915-AK6	L605	m/s

Sensor	Sensor Type Order No.	ALMEMO® Type	Connector Order No.	Abbr.	Dim
Turbine flow meter	FV A915-VR	counter	ZA 9909-AK1	Freq	m/s
Turbine flow meter	FV A915-VTH	counter		Freq	m/s
Thermoanemometer:					
1. Temperature	FV A645-THx	normal		D2.6	°C
2. Flow				D2.6	m/s
1. Flow 40 m/s with TC and PC	FD A602-M1K	module		L840	m/s
2. Dynamic pressure 2000 Pa				Volt	Pa
1. Flow 90 m/s with TC and PC	FD A602-M6	module		L890	m/s
2. Dynamic pressure 6800 Pa				Volt	Pa
1. Temperature NiCr-Ni	FD A622-M1	module		NiCr	°C
2. Flow 40 m/s with TC and PC				L840	m/s
1. Temperature NiCr-Ni	FD A622-M6	module		NiCr	°C
2. Flow 90 m/s with TC and PC				L890	m/s
Pressure transducers: Barometer	FD A612-MA	module		Volt	mb
Press. transduc. 0.1...1000 bar 0.5%	FD 8214	cable	ZA8214-AK	D2.6	br
Press. transducer 2.5...100 bar 1%	FD A602-L	cable		D2.6	br
1. Press. transducer 10...30 bar 1%	FD A602-LxAK	cable		D2.6	br
2. Temperature refrigerant R22, R23, R134a, R404a, R407c, R410, R417a, R507*				R 22	°C
Tachometer sensors:					
Tachometer sensor analog	FU A619	divider	ZA 9019-FS	Volt	Um
Tachometer sensor digital	FU A919-2	counter		Freq	Um
Light sensors					
1. 26000 Lux	FL A613-VL	normal		mV 2	Lx
2. 260 kLux				mV 2	kL
pH probes:					
pH probe	FY A8PH-xx	cable	ZA 9610-AKY4	D2.6	pH
1. Temperature Ntc type N	FY A8PH-xx	cable	ZA 9640-AKY4	Ntc	°C
2. pH probe with TC				D2.6	pH
Redox probe	FY A8RX-xx	cable	ZA 9610-AKY5	D2.6	mV
Conductivity probe					
1. Ntc type N	FY A641-LF	normal		Ntc	°C
2. Conductivity with TC				LF	mS
O₂ probe for solute oxygen in liquids					
1. Ntc type N	FY A640-O2	normal		Ntc	°C
2. O ₂ saturation with TC and PC				O2-S	%
3. O ₂ concentration with TC				O2-C	mg
O₂ sensor for gases	FY A600-O2	normal		mV 2	%
CO₂ sensor for gases	FY A600-CO2	normal		CO2	%

TC = Temperature Compensation, PC = Atmospheric Pressure Compensation



All ALMEMO® sensors can be calibrated, i.e. corrective factors of the sensor can be stored in the connector plug.

This considerably increases the accuracy of measurement.

As a result of the DKD and factory-set calibrations performed by us, the corrective factors are automatically determined, stored in the connector plug and locked.

Maximum accuracy can then be achieved.