Data Sheet

Programmable
Multi Transducer

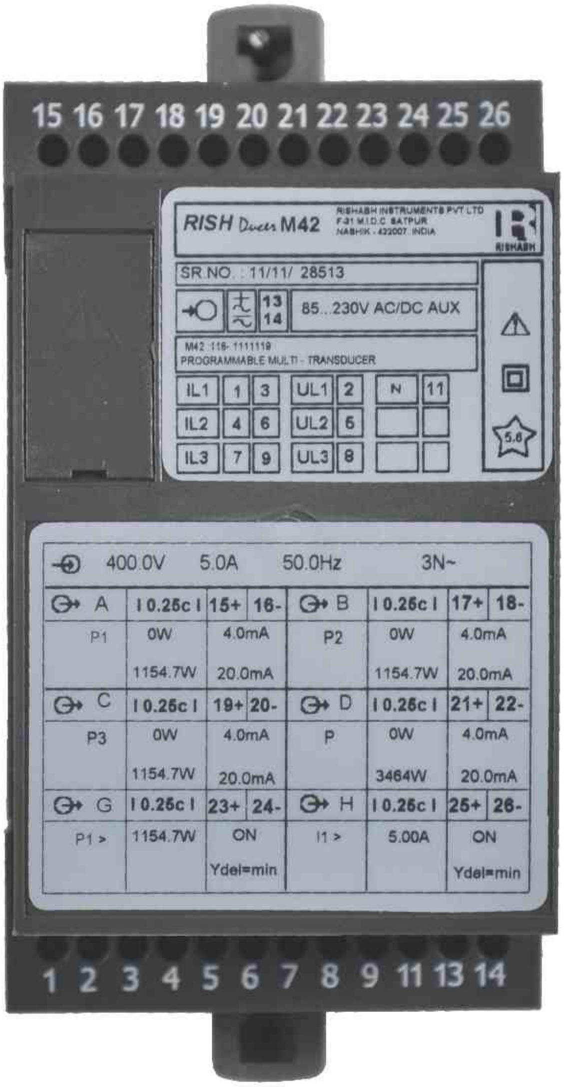


Fig. 1. The basic version universal
RISH Ducer MXX in housing clipped onto a top-hat rail.

Application

for the measurement of electrical variables in heavy current power systems

The RISH Ducer MXX series of multi-transducers (Fig. 1) **simultaneously** measure several variables of an electric power system and process them to produce 2 or 3 or 4 analogue output signals. 2 or 4 digital outputs are available for signaling limits or power metering. For two of the limit outputs up to 3 measurands can be logically combined.

The multi - transducers are also equipped with an serial **RS 232** interface to which a PC with the corresponding software can be connected for programming or accessing & executing useful ancillary functions. The usual modes of connection, the types of measured variables,their ratings, the transfer characteristic for each output etc. are the main parameters that have to be programmed.

Ancillary functions include a power system check, provision for displaying the measured variable on a PC monitor, the simulation of the outputs for test purposes and a facility for printing nameplates.

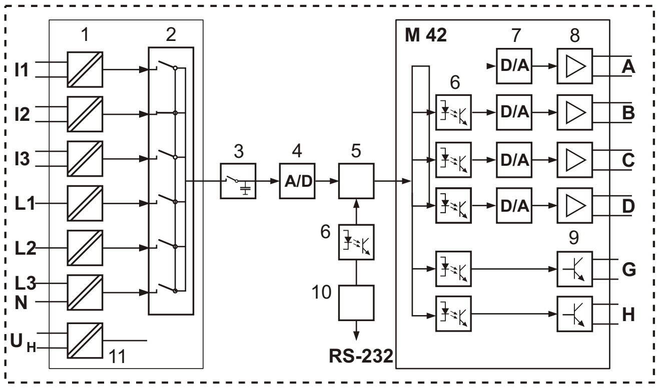
Unique Features

- For all heavy-current power system variables
- Up to 6 outputs (2A + 4D or 4A + 2D or 2A or 3A)
- Input voltage up to 693 V (phase-to-phase)
- Universal analogue outputs (programmable)
- Simultaneous measurement of several variables of a heavy-current power system / full supervision of an asymmetrically loaded four-wire power system, rated current 1 to 6 A, rated voltage 57 to 400 V(phase to neutral) or 100 to 693 V (phase-to-phase)
- High accuracy: U/I 0.2%, Frequency 0.15% and P 0.25% (under reference conditions)
- Universal digital outputs (meter transmitter, limits)
- Up to 2 or 4 integrated power meters.
- AC/DC power supply/universal (24-60V AC/DC or 85-230V AC/DC)
- Provision for either snapping the transducer onto top - hat rails or securing it with screws to a wall or panel
- Windows software with password protection for programming, data analysis, power system status simulation, acquisition of meter data and making settings

Table 1 :

Measured variables	Output	Types
Current, voltage (rms), active/reactive/ apparent power cos, sin, power factor RMS value of the current with wire setting range (bimetal measuring function) Slave pointer function for the measurement of the RMS value IB Frequency Average value of the currents with sign of the active power (power system only)	2 analogue outputs	RISH Ducer M20
	3 analogue outputs	RISH Ducer M30
	2 analogue outputs and 4 digital outputs or	RISH Ducer M24
	4 analogue outputs and 2 digital outputs	RISH Ducer M42
	4 analogue outputs and bus RS 485 (MODBUS)	RISH Ducer M40 *
	Data bus (LON) M00	RISH Ducer M00 *
	Bus RS 485 (MODBUS)	RISH Ducer M01 *

* Refer dedicated data sheet for complete product details.



1 = Input transformer
2 = Multiplexer
3 = Latching stage
4 = A/D converter
5 = Microprocessor
6 = Electrical insulation
7 = D/A converter
8 = Output amplifier/latching stage
9 = Digital output (open-collector)
10 = Programming interface RS-232
11 = Power supply

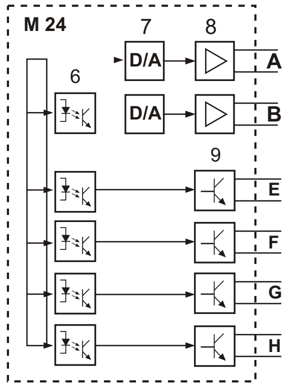


Fig. 2. Block diagram.

Table 2 : A, B, C, D = analogue outputs; E, F, G, H = digital outputs.

Models	Analog Output	Digital Output	Communication type	Programming Port
M42	4(A,B,C,D)	(G,H)	-	RS 232
M24	2(A,B)	(E,F,G,H)	-	RS 232
M20	2(A,B)	-	-	RS 232
M30	3(A,B,C)	-	-	RS 232
M00	-	-	LON Bus	RS 232
M40	4(A,B,C,D)	-	RS 485	RS 232
M01	-	-	RS 485	RS 232

Symbols and their meaning

Table 3

Symbols	Meaning
X	Measured variable
X0	Lower limit of the measured variable
X1	Break point of the measured variable
X2	Upper limit of the measured variable
Y	Output variable
Y0	Lower limit of the output variable
Y1	Break point of the output variable
Y2	Upper limit of the output variable
U	Input voltage
Ur	Rated value of the input voltage
U 12	Phase-to-phase voltage L1 - L2
U 23	Phase-to-phase voltage L2 - L3
U 31	Phase-to-phase voltage L3 - L1
U1N	Phase-to-neutral voltage L1 - N
U2N	Phase-to-neutral voltage L2 - N
U3N	Phase-to-neutral voltage L3 - N
UM	Average value of the voltages
	(U1N + U2N + U3N) / 3
I	Input current
I1	AC current L1

I2	AC current L2
I3	AC current L3
Ir	Rated value of the input current
IM	Average value of the currents (I1+ I2 + I3) / 3
IMS	Average value of the currents and sign of the active power (P)
IB	RMS value of the current with wire setting range (bimetal measuring function)
IBT	Response time for IB
BS	Slave pointer function for the measurement of the RMS value IB
BST	Response time for BS
φ	Phase-shift between current and voltage
F	Frequency of the input variable
Fn	Rated frequency
P	Active power of the system P = P1 + P2 + P3
P1	Active power phase 1 (phase-to-neutral L1 - N)
P2	Active power phase 2 (phase-to-neutral L2 - N)
P3	Active power phase 3 (phase-to-neutral L3 - N)
Q	Reactive power of the system Q = Q1 + Q2 + Q3
Q1	Reactive power phase 1 (phase-to-neutral L1-N)
Q2	Reactive power phase 2 (phase-to-neutral L2-N)
Q3	Reactive power phase 3 (phase-to-neutral L3-N)
S	Apparent power of the system $S = \sqrt{I_1^2 + I_2^2 + I_3^2} \cdot \sqrt{U_1^2 + U_2^2 + U_3^2}$
S1	Apparent power phase 1 (phase-to-neutral L1-N)
S2	Apparent power phase 2 (phase-to-neutral L2-N)
S3	Apparent power phase 3 (phase-to-neutral L3-N)
Sr	Rated value of the apparent power of the system
PF	Active power factor cos φ =P/S
PF1	Active power factor phase1 P1/S1
PF2	Active power factor phase2 P2/S2
PF3	Active power factor phase3 P3/S3
QF	Reactive power factor sin j =Q/S
QF1	Reactive power factor phase1 Q1/S1
QF2	Reactive power factor phase2 Q2/S2
QF3	Reactive power factor phase3 Q3/S3
LF	Power factor of the system LF = sgnQ (1- PF)
LF1	Power factor phase 1 sgnQ1 (1 - PF1)
LF2	Power factor phase 2 sgnQ2 (1 - PF2)
LF3	Power factor phase 3 sgnQ3 (1 - PF3)
c	Factor for the intrinsic error
R	Output load
Rn	Rated burden

Symbols	Meaning
H	Power supply
Hn	Rated value of the power supply
CT	c.t. ratio
VT	v.t. ratio

Technical data

Input

Input variables	see Table 10 (Page 6) and 15 (Page 11)
Measuring ranges	see Table 10 (Page 6) and 15 (Page 11)
Waveform	Sinusoidal
Rated frequency	50...60 Hz; 16 2/3 Hz
Own consumption	Voltage circuit: $\leq U^2 / 400\ k\Omega$ Condition: external power supply Current circuit: 0.3 VA I/5 A

Table 5 : Continuous thermal ratings of inputs

Current circuit	10 A 400 V single-phase AC system 693 V three-phase system
Voltage circuit	480V single-phase AC system 831V three-phase system

Table 6 :Short-time thermal rating of inputs

Input variable	Number of inputs	Duration of overload	Interval between two overloads
Current circuit	400 V single-phase AC system 693 V three-phase system		
100 A	5	3 s	5 min.
250 A	1	1 s	1 hour
Voltage circuit	1 A, 2 A, 5 A		
Single-phase AC system 600 V H_{intern}: 1.5 Ur	10	10 s	10 s.
Three-phase system 1040 V H_{intern}: 1.5 Ur	10	10 s	10 s.

Table 7 : Analogue output

Output variable Y		Impressed DC current	Impressed DC voltage
Full scale Y2		see "Ordering information"	see "Ordering information"
Limits of output signal for input overload and/or	R=0	see "Ordering information" 1.25 Y2	see "Ordering information" 40 mA
	$R \to \infty$	30V	1.25 Y2
Rated useful range of output load		$0 \leq \frac{7.5\ V}{Y2} \leq \frac{15\ V}{Y2}$	$\frac{Y2}{2\ mA} \leq \frac{Y2}{1\ mA} \leq \infty$
AC component of output signal (peak-to-peak)		$\leq$ 0.005 Y2	$\leq$ 0.005 Y2

The outputs A, B, C and D may be either short or open-circuited. They are electrically insulated from each other and from all other circuits (floating)

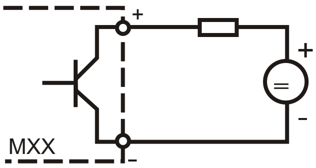
All the full - scale output values can be reduced subsequently using the programming software, but a supplementary error results. The hardware full-scale settings for the analogue outputs may also be changed subsequently. Conversion of a current to a voltage output or vice versa is also possible. This necessities changing resistors on the output board. The full-scale values of the current and voltage outputs are set by varying the effective value of two parallel resistors (better resolution). The values of the resistors are selected to achieve the minimum absolute error. Calibration with the programming software is always necessary following conversion of the outputs. Refer to the Operating Instructions.

Caution : The warranty is void if the device is tampered.

Digital outputs, pulse outputs, limit outputs

The digital outputs conform to DIN43 864. The pulse width can be neither programmed nor is there a hardware setting.

Type of contact	Open collector
Number of pulses	see "Ordering information"
Pulse duration	$\geq$ 100 ms
Interval	$\geq$ 100 ms
Power supply	8 ... 40 V
Output current	ON 10 ... 27 mA OFF $\leq$ 2 mA



System response

Accuracy class (the reference value is the full-scale value Y2)

Table 8 :

Measured variable	Condition	Accuracy class*
System: Active, reactive and apparent power	$0.5 \leq X2/Sr \leq 1.5$ $0.3 \leq X2/Sr < 0.5$	0.25 c 0.5 c
Phase: Active, reactive and apparent power	$0.167 \leq X2/Sr \leq 0.5$ $0.1 \leq X2/Sr < 0.167$	0.25 c 0.5 c
Power factor, active power and reactive power	$0.5Sr \leq S \leq 1.5$ Sr, (X2 - X0) = 2	0.25 c
	$0.5Sr \leq S \leq 1.5$ Sr, $1 \leq$ (X2 - X0) < 2	0.5 c
	$0.5Sr \leq S \leq 1.5$ Sr, $0.5 \leq$ (X2 - X0) < 1	1.0 c
	$0.1Sr \leq S < 0.5$ Sr, (X2 - X0) = 2	0.5 c
	$0.1Sr \leq S < 0.5Sr$, $1 \leq$ (X2 - X0) < 2	1.0 c
	$0.1Sr \leq S < 0.5Sr$, $0.5 \leq$ (X2 - X0) < 1	2.0 c
AC Voltage	$0.1\ Ur \leq U \leq 1.2\ Ur$	0.2 c
AC current/ current averages	$0.1\ Ir \leq I \leq 1.5\ Ir$	0.2 c
System frequency	$0.1\ Ur \leq U \leq 1.2\ Ur$ resp. $0.1\ Ir \leq I \leq 1.5\ Ir$	0.15+ 0.03 c (f_N =50...60 Hz) 0.15 + 0.1 c (f_N =16 2/3 Hz)
Pulse	acc. to IEC 1036 $0.1\ Ir \leq I \leq 1.5\ Ir$	1.0 c

* Basic accuracy 0.5 c for applications with phase-shift

Duration of the measurement cycle	Approx. 0.25 to 0.5 s at 50 Hz, depending on measured variable & programming
Response time	1 ... 2 times the measurement cycle

Factor c (the highest value applies)

Linear characteristic

$$c = \frac{1 - \frac{Y0}{Y2}}{1 - \frac{X0}{X2}} \text{ or } c = 1$$

Bent characteristic

$X0 \leq X \leq X1$

$$c = \frac{Y1 - Y2}{X1 - X2} \bullet \frac{X2}{Y2} \text{ or } c = 1$$

$X1 \leq X \leq X2$

$$c = \frac{1 - \frac{Y1}{Y2}}{1 - \frac{X1}{X2}} \text{ or } c = 1$$

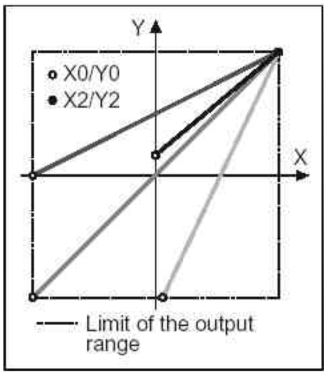


Fig. 3. Examples of settings with linear characteristic.

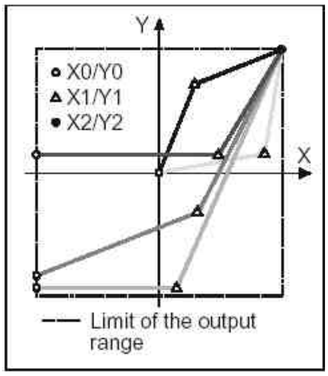


Fig. 4. Examples of settings with bent characteristic.

Reference conditions

Ambient temperature	+ 23^{0}C ± 1 K
Pre-conditioning	30 min. acc. to DIN EN 60 688 Section 4.3, Table 2
Input variable	Rated useful range
Power supply	H =Hn + 1%
Active/reactive factor	cosφ=1 resp. sin = 1
Frequency	50 ... 60 Hz, 16 2/3 Hz
Waveform	Sinusoidal, form factor 1.1107
Output load	DC current output: $R_n = \frac{7.5\ V}{Y2} \pm 1\%$ DC voltage output: $R_n = \frac{Y2}{1\ mA} \pm 1\%$
Miscellaneous	DIN EN 60 688

Influencing quantities and permissible variations

Acc. to DIN IEC 688

Power Supply

AC voltage	100, 110, 230, 400, 500 or 693 V, + 10%, 45 to 65 Hz Power consumption approx. 10 VA

AC/DC power pack (DC and 50 ... 60 Hz)

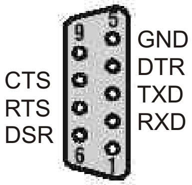
Table 9: Rated voltages and tolerances

Rated voltage U_N	Tolerance
24 ... 60 V DC/AC	DC -15 ... + 33% AC ±10%
85 ... 230 V DC/AC	

Consumption: $\leq$ 9 W resp. $\leq$10VA

Programming connector on transducer

Interface	RS 232 C
DSUB socket	9-pin



The interface is electrically insulated from all other circuits

Ambient conditions

Climatic rating	Climate class 3 acc. to VDI/VDE3540
Variations due to ambient temperature	± 0.1% / 10 K
Nominal range of use for temperature	0...15...30...45°C(usage group II)
Storage temperature	- 40 to + 850 C
Annual mean relative humidity	≤ 75%

Applicable standards and regulations

Table 4 :

DIN EN 60 688	Electrical measuring transducers for converting AC electrical variables into analogue and digital signals
IEC 1010 or EN 61 010	Safety regulations for electrical measuring, control and laboratory equipment
EN 60529	Protection types by case (code IP)
IEC 255-4 Part E5	High-frequency interference test (solid-state relays only)
IEC 1000-4-2,3,4,6	Electromagnetic compatibility for industrial process measurement & control equipment
VDI/VDE 3540, page2	Reliability of measuring and control equipment (classification of climates)
DIN 40 110	AC quantities
DIN 43 807	Terminal markings
IEC 68 /2-6	Basic environmental testing procedures, vibration, sinusoidal
IEC 1036	Solid state AC watt hour meters for active power (Classes 1 and 2)
DIN 43864	Current interface for the transmission of impulses between impulse encoder counter and tariff meter
UL 94	Tests for flammability of plastic materials for parts in devices and appliances

Safety

Protection class	II
Enclosure protection	IP 40, housing IP 20, terminals
Overvoltage category	III
Insulation test (versus earth)	Input voltage : AC 400 V Input current : AC 400 V Output : DC 40 V Power supply : AC 400 V DC 230 V
Surge test	5 KV; 1.2/50 µs; 0.5 Ws
Test voltages	50 Hz, 1 Min. according to DIN EN 61 010-1 5550 V, inputs versus all other circuits as well as outer surface 3250 V, input circuits versus each other 3700 V, power supply versus outputs and SCI as well as outer surface 490 V, outputs and SCI versus each other and versus outer surface

Vibration withstand

(tested according to DIN EN 60 068-2-6)

Acceleration	± 2 g
Frequency range	10...150 10 Hz, rate of frequency sweep: 1 octave/minute
Number of cycles	10 in each of the three axes
Result	No faults occurred, no loss of accuracy and no problems with the snap fastener

Installation data

Housing	HousingT24 See Section "Dimensioned drawings"
Housing material	Lexan 940 (polycarbonate), flammability class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen
Mounting	For snapping onto top-hat rail (35X15 mm or 35X7.5 mm) acc. to EN 50 022 or directly onto a wall or panel using the pull-out screw hole brackets
Orientation	Any
Weight	With supply transformer approx. 1.1 kg With AC/DC power pack approx. 0.7 kg

Terminals

Type	Screw terminals with wire guards
Max. wire gauge	≤ 4.0 mm² single wire or 2 X 2.5 mm² fine wire (use Taparia Screw driver-type 902)
Lugs	To use flat head lugs with total metal length (J) greater than or equal to 17mm.

Lug

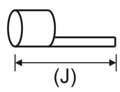


Table 10 : RISH Ducer MXX, standard version

The two versions of the transducer below with the **basic** programming are available AC Aux. & AC/DCAux.

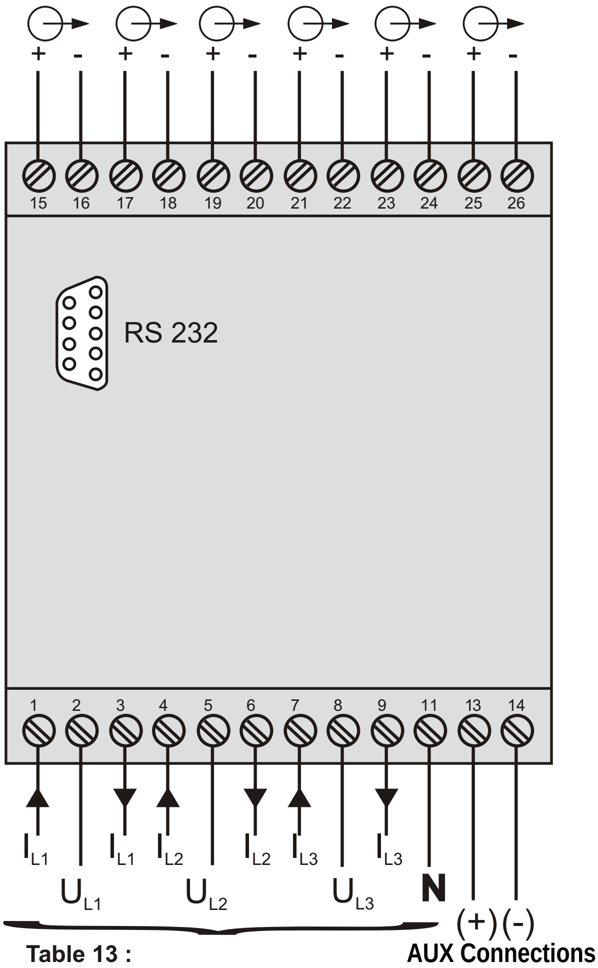
Description / Basic programming		**M 42**	**M 24**	**M20**	**M30**	**M40**	**M00**	**M01**
Mechanical design:	Housing T24 for rail and wall mounting	☐						
Rated frequency:	50 Hz (60 Hz admissible without additional error, re-programming by user for 16 2/3Hz possible, but with additional error 1.25 c)	☐						
Power supply:	**230 VAC**	☐						
	85...230 V DC/AC	☐						
Power supply:	External connection (standard)	☐	☐	☐	☐	☐	☐	☐
Full-scale output signal, output A:	Y2 = 20 mA	☐	☐	☐	☐	☐	N. A.	N. A.
Full-scale output signal, output B:	Y2 = 20 mA	☐	☐	☐	☐	☐	N. A.	N. A.
Full-scale output signal, output C:	Y2 = 20 mA	☐	N. A.	N. A.	N. A.	☐	N. A.	N. A.
Full-scale output signal, output D:	Y2 = 20 mA	☐	N. A.	N. A.	N. A.	☐	N. A.	N. A.
Test certificate:	None supplied	☐	☐	☐	☐	☐	☐	☐
Programming:	Basic	☐	☐	☐	☐	☐	☐	☐
Optional Display: See Table 15 : "Ordering information for MXX models" RISH Ducer		N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
Basic programming								
Application:	4-wire,3-phase system, asymmetric load(NPS)	☐						
Input voltage:	Design value Ur = 400 V	☐						
Input current:	Design value Ir = 5 A without specification of primary ratings	☐						
Measured variable, output A: Output signal, output A:	P1; X0= 115.47 W; X2 = 115.47 W # DC current Y0 = - 20 mA; Y2 = 20 mA Linear characteristic Standard limits	☐	☐	☐	☐	☐	N. A.	N. A.
Measured variable, output B: Output signal, output B:	P2; X0 = - 115.47; X2 = 115.47 W # DC current Y0 = - 20 mA; Y2 = 20 mA Linear characteristic Standard limits	☐	☐	☐	☐	☐	N. A.	N. A.
Measured variable, output C: Output signal, output C:	P3; X0 = 115.47 W; X2 = 115.47 W # DC current Y0 = - 20 mA; Y2 = 20 mA Linear characteristic Standard limits	☐	N. A.	N. A.	☐	☐	N. A.	N. A.
Measured variable, output D: Output signal, output D:	P; X0 = - 346.41; X2 = 346.41 W# DC current Y0 = - 20 mA; Y2 = 20 mA Linear characteristic Standard limits	☐	N. A.	N. A.	N. A.	☐	N. A.	N. A.
Output signal, output E:	Limit P; XI = 311.77 W # Output ON if X>XI Min. pick-up delay	N. A.	☐	N. A.	N. A.	N. A.	N. A.	N. A.
Output signal, output F:	Limit Q; XI= 34.64 var # Output ON if X>XI Min. pick-up delay	N. A.	☐	N. A.	N. A.	N. A.	N. A.	N. A.
Measured variable, output G:	Limit P1; XI= 115.47 W # Output ON if X> XI Min. pick-up delay	☐	☐	N. A.	N. A.	N. A.	N. A.	N. A.
Measured variable, output H:	Limit I1; XI = 2 A # Output ON if X> X1 Min. pick-up delay	☐	☐	N. A.	N. A.	N. A.	N. A.	N. A.

Other specifications on request contact to Factory

Electrical Connections

Table 11 :

Function			Connection
Meas. input	AC current	IL1	1 / 3
		IL2	4 / 6
		IL3	7 / 9
Meas. input	AC Voltage	UL1	2
		UL2	5
		UL3	8
		N	11
Outputs	Analogue	Digital	
→○	A	+	15
		–	16
	B	+	17
		–	18
	C	E +	19
		–	20
	D	F +	21
		–	22
		G +	23
		–	24
		H +	25
		–	26
Power Supply	AC	~	13
		~	14
	DC	+	13
		-	14



If power supply is taken from the measured voltage internal connections are as follow:

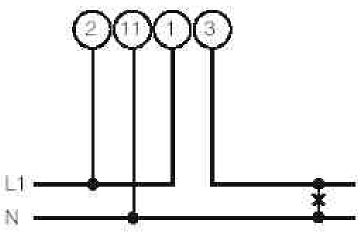
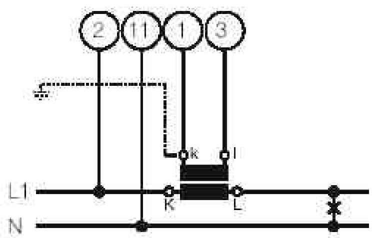
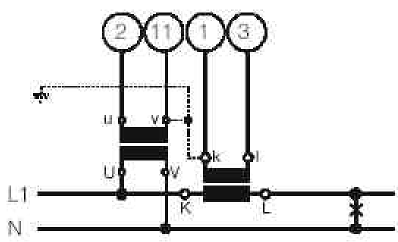
Table 12 :

Application (system)	Internal connection Terminal / System
Single phase AC current	2 / 11 (L1 - N)
4-wire 3-phase symmetric load	2 / 11 (L1 - N)
All other *	2 /5 (L1 - L2)

Table 13 :

	Modbus
M40	23, 24, 25, 26 (RS 485)
M00	15, 16 LON Bus
M01	23, 24, 25, 26 (RS 485)

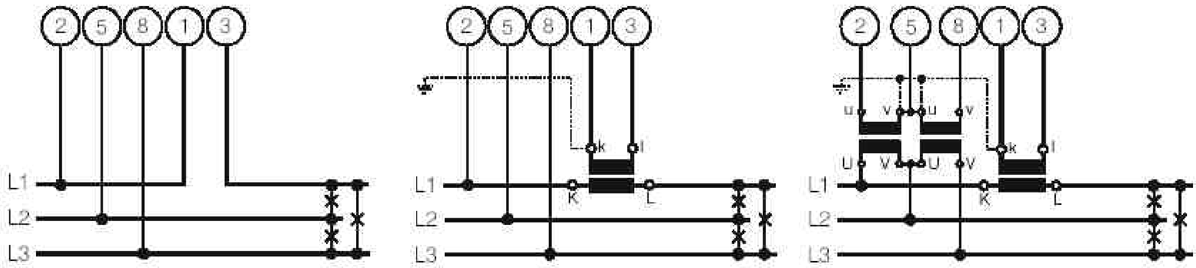
Table 14 :

	Measuring input
System / application	Terminals
Single-phase AC system	  

Measuring input

System / application	Terminals

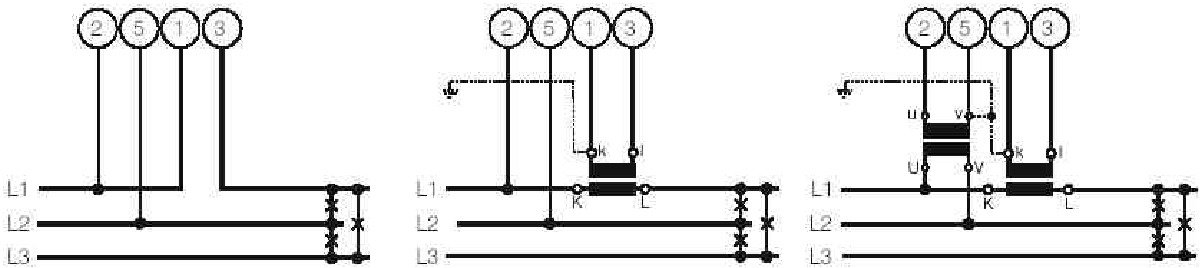
3-wire
3-phase
symmetric
load
I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

Current transformer	Terminals		2	5	8
L1	1	3	L2	L3	L1
L3	1	3	L3	L1	L2

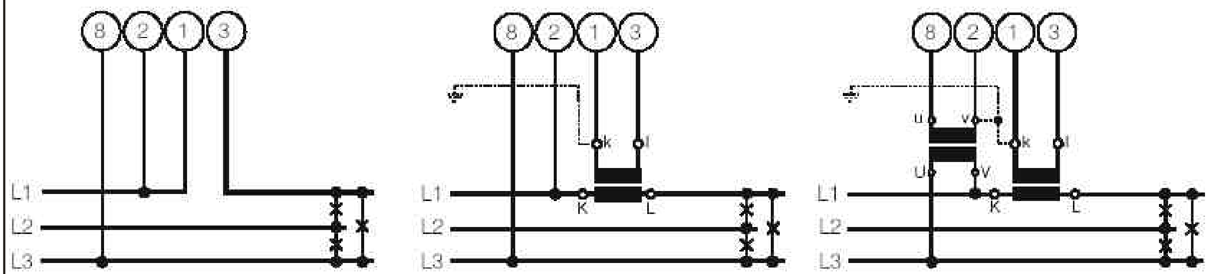
3-wire
3-phase
symmetric
load
Phase-shift
U: L1 - L2
I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

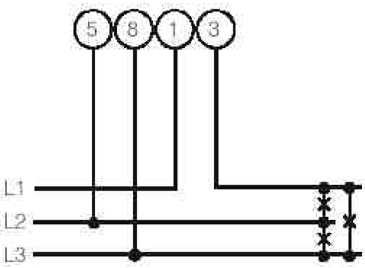
Current transformer	Terminals		2	5
L2	1	3	L2	L3
L3	1	3	L3	L1

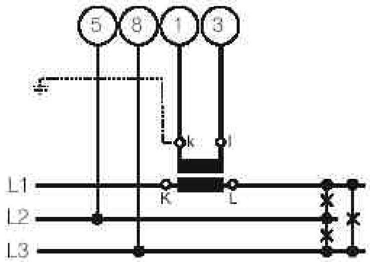
3-wire
3-phase
symmetric
load
Phase-shift
U: L3 - L1
I: L1

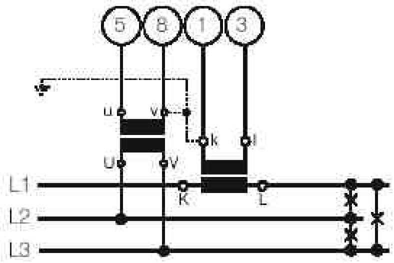


Connect the voltage according to the following table for current measurement in L2 or L3:

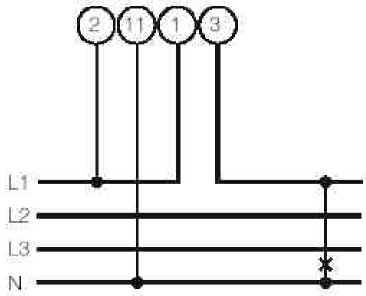
Current transformer	Terminals		8	2
L2	1	3	L1	L2
L3	1	3	L2	L3

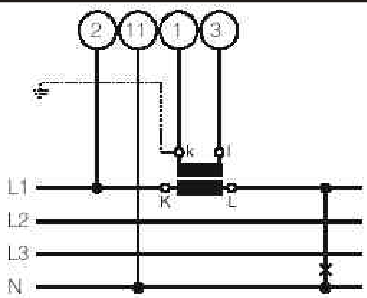
<table>
<tr><th colspan="2">Measuring input</th></tr>
<tr><th>System / application</th><th>Terminals</th></tr>
<tr><td>3-wire
3-phase
symmetric
load
Phase-shift
U: L2 - L3
I: L1</td><td>


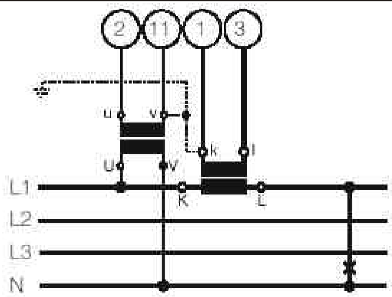




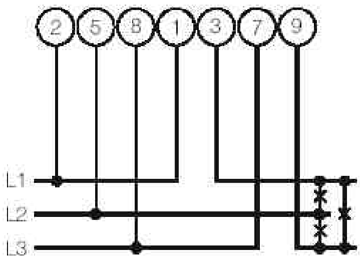
Connect the voltage according to the following table for current measurement in L2 or L3:

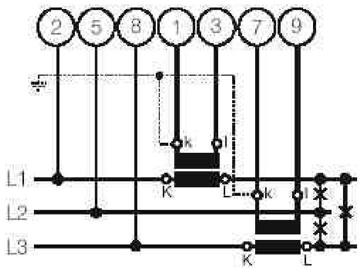
<table>
<tr><td>Current transformer</td><td colspan="2">Terminals</td><td>5</td><td>8</td></tr>
<tr><td>L2</td><td>1</td><td>3</td><td>L3</td><td>L1</td></tr>
<tr><td>L3</td><td>1</td><td>3</td><td>L1</td><td>L2</td></tr>
</table>
</td></tr>
<tr><td>4-wire
3-phase
symmetric
load
I: L1</td><td>


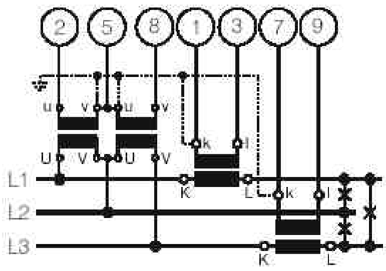


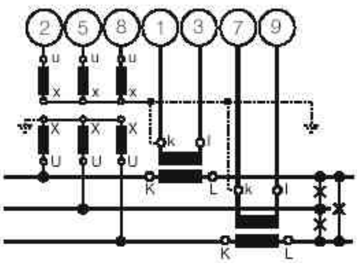


Connect the voltage according to the following table for current measurement in L2 or L3:

<table>
<tr><td>Current transformer</td><td colspan="2">Terminals</td><td>2</td><td>11</td></tr>
<tr><td>L2</td><td>1</td><td>3</td><td>L2</td><td>N</td></tr>
<tr><td>L3</td><td>1</td><td>3</td><td>L3</td><td>N</td></tr>
</table>
</td></tr>
<tr><td>3-phase
3-wire
asymmetric
load *</td><td>


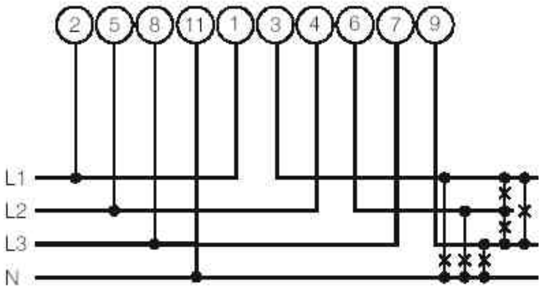
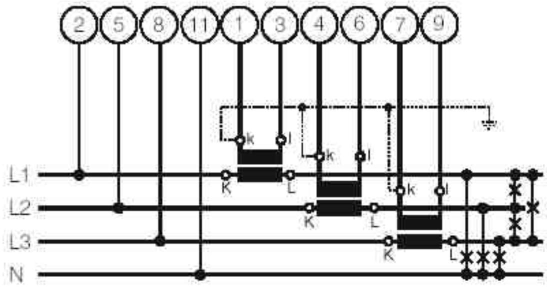
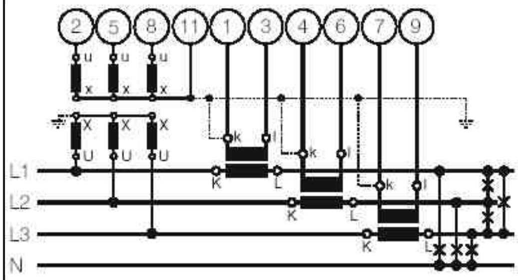
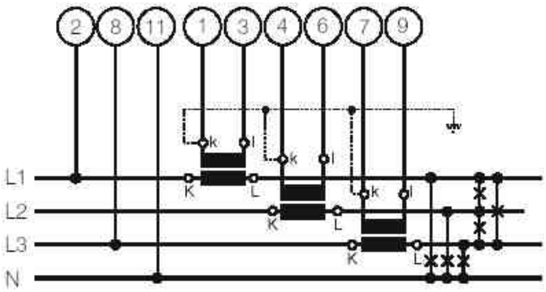
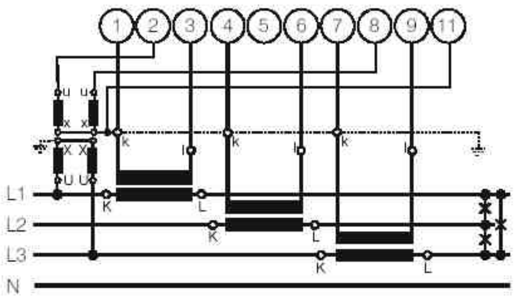






</td></tr>
</table>

* Contact to factory for complete details

Measuring input	
System / application	Terminals
3-phase 3-wire asymmetric load *	   3 single-pole insulated voltage transformers in high-voltage system
4-wire asymmetric load, 3-phase Open Y connection*	 Low-voltage system  2 single-pole insulated voltage transformers in high-voltage system

* Contact to factory for complete details

Relationship between PF, QF and LF

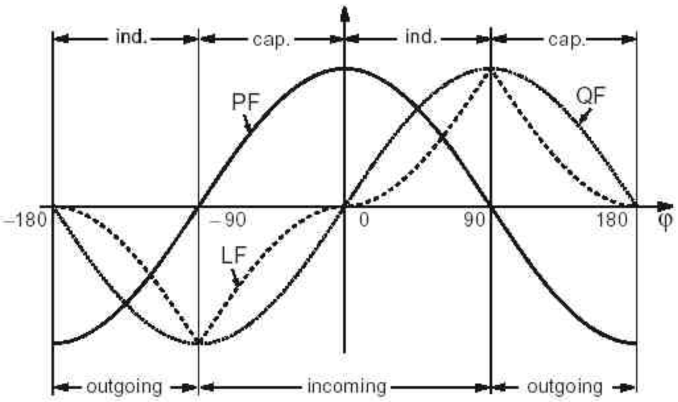


Fig. 5. Active power PF----- , reactive power QF ------, power factor LF------ .

Dimensional Drawing

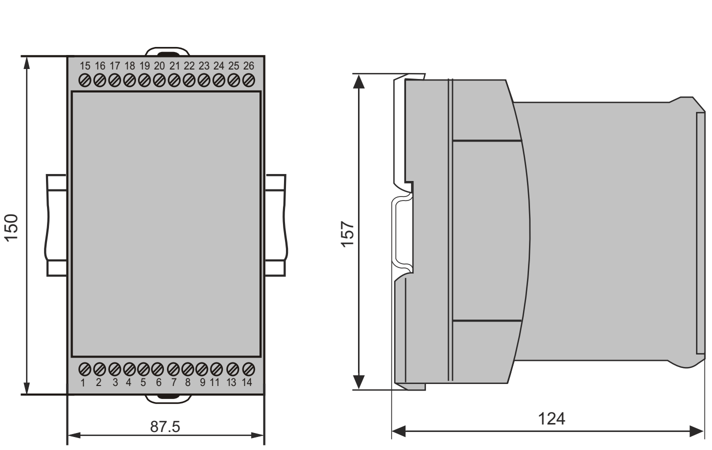


Fig. 6. RISH *Ducer* MXX in housing T24 clipped onto a top-hat rail (35 X 15 mm or 35 X 7.5 mm, acc. to EN 50 022).

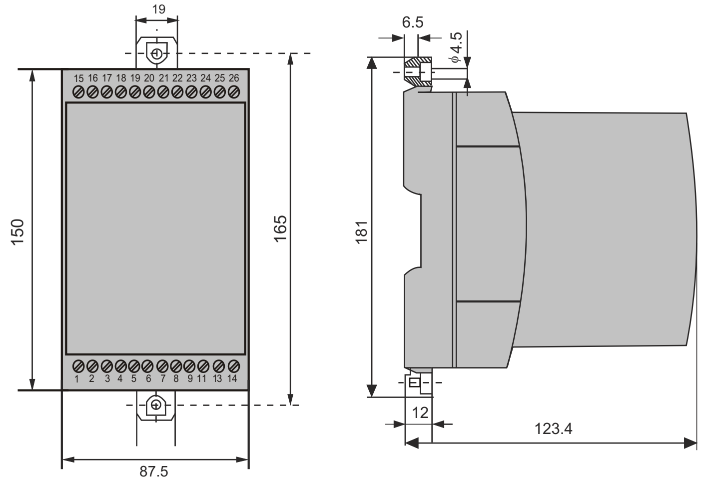


Fig. 7. RISH *Ducer* MXX in housing T24, screw hole mounting brackets pulled out.

Ordering Information

Table 15 : Ordering information for RISH *Ducer* MXX models
(see also Table 10: Standard version)

<table>
<tr><th>DESCRIPTION</th><th>M42</th><th>M24</th><th>M20</th><th>M30</th><th>M40</th><th>M00</th><th>M01</th></tr>
<tr><td>1. Specify the type of system
(1 phase, 3 phase 3 wire / 3 phase 4 wire / balanced / unbalanced etc.) C.T. / P.T. Ratio</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Rated frequency
1) 50 Hz (60 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 •c)
2) 60 Hz (50 Hz possible without additional error; 16 2/3 Hz, additional error 1.25 •c)
3) 16 2/3 Hz (not re-programming by user, 50/60 Hz possible, but with additional error 1.25 •c)</td><td colspan="7">
☐
☐
☐</td></tr>
<tr><td>3. Power supply
1) DC/AC 24 ... 60 V
2) DC/AC 85 ... 230 V</td><td colspan="7">
☐
☐</td></tr>
<tr><td>4. Power supply connection
1) External (standard)
2) Internal from voltage input **
Line 2: Not available for rated frequency 16 2/3 Hz
Contact Factory for further details</td><td colspan="7">
☐
☐</td></tr>
<tr><td>5. Full-scale output signal, output A</td><td>N. A.</td><td>N. A.</td><td>N. A.</td><td>N. A.</td><td>N. A.</td><td>N. A.</td><td>N. A.</td></tr>
<tr><td>1) Output A, Y2 =20 mA (standard)</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>N. A.</td><td>N. A.</td></tr>
<tr><td>9) Output A, Y2 [mA] *</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>N. A.</td><td>N. A.</td></tr>
<tr><td>Z) Output A, Y2 [V] *
Line 9: Full-scale current Y2 [mA] 1 to 20
Line Z: Full-scale voltage Y2 [V] 1 to 10</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>N. A.</td><td>N. A.</td></tr>
</table>

* Specify separately
** Contact Factory for complete details

DESCRIPTION	M42	M24	M20	M30	M40	M00	M01
6. Full-scale output signal, output B							
1) Output B, Y2 =20 mA (standard)	☐	☐	☐	☐	☐	N.A.	N.A.
9) Output B, Y2 [mA] *	☐	☐	☐	☐	☐	N.A.	N.A.
Z) Output B, Y2 [V] *	☐	☐	☐	☐	☐	N.A.	N.A.
7. Full-scale output signal, output C							
1) Output C, Y2 = 20 mA (standard)	☐	N.A.	N.A.	☐	☐	N.A.	N.A.
9) Output C, Y2 [mA] *	☐	N.A.	N.A.	☐	☐	N.A.	N.A.
Z) Output C, Y2 [V] *	☐	N.A.	N.A.	☐	☐	N.A.	N.A.
8. Full-scale output signal, output D							
1) Output D, Y2 =20 mA (standard)	☐	N.A.	N.A.	N.A.	☐	N.A.	N.A.
9) Output D, Y2 [mA] *	☐	N.A.	N.A.	N.A.	☐	N.A.	N.A.
Z) Output D, Y2 [V] *	☐	N.A.	N.A.	N.A.	☐	N.A.	N.A.
9. Digital Output E							
Specify output i) Limit control or	N.A.	☐	N.A.	N.A.	N.A.	N.A.	N.A.
ii) Pulse output	N.A.	☐	N.A.	N.A.	N.A.	N.A.	N.A.
Also specify the parameter and their details separately							
10. Digital Output F							
Specify output i) Limit control or	N.A.	☐	N.A.	N.A.	N.A.	N.A.	N.A.
ii) Pulse output	N.A.	☐	N.A.	N.A.	N.A.	N.A.	N.A.
Also specify the parameter and their details separately							
11. Digital Output G							
Specify output i) Limit control or	☐	☐	N.A.	N.A.	N.A.	N.A.	N.A.
ii) Pulse output	☐	☐	N.A.	N.A.	N.A.	N.A.	N.A.
Also specify the parameter and their details separately							
12. Digital Output H							
Specify output i) Limit control or	☐	☐	N.A.	N.A.	N.A.	N.A.	N.A.
ii) Pulse output	☐	☐	N.A.	N.A.	N.A.	N.A.	N.A.
Also specify the parameter and their details separately							
13. Test certificate							
0) None supplied				☐			
1) Supplied				☐			
14. Programming							
0) Basic				☐			
9) According to specification				☐			
Line 0: Not available if the power supply is taken from the voltage input							

* Specify separately