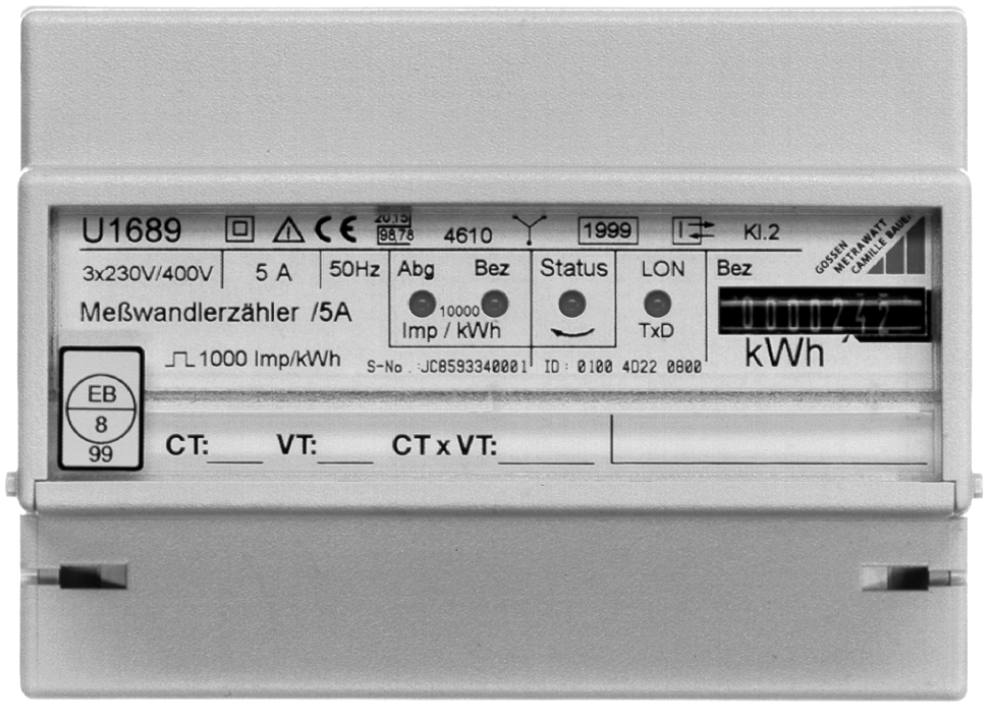
Operating Instructions

Energy Meters

U1681 ... U1689

U3681 ... U3689

3-348-832-21
8/8.00



Safety Precautions

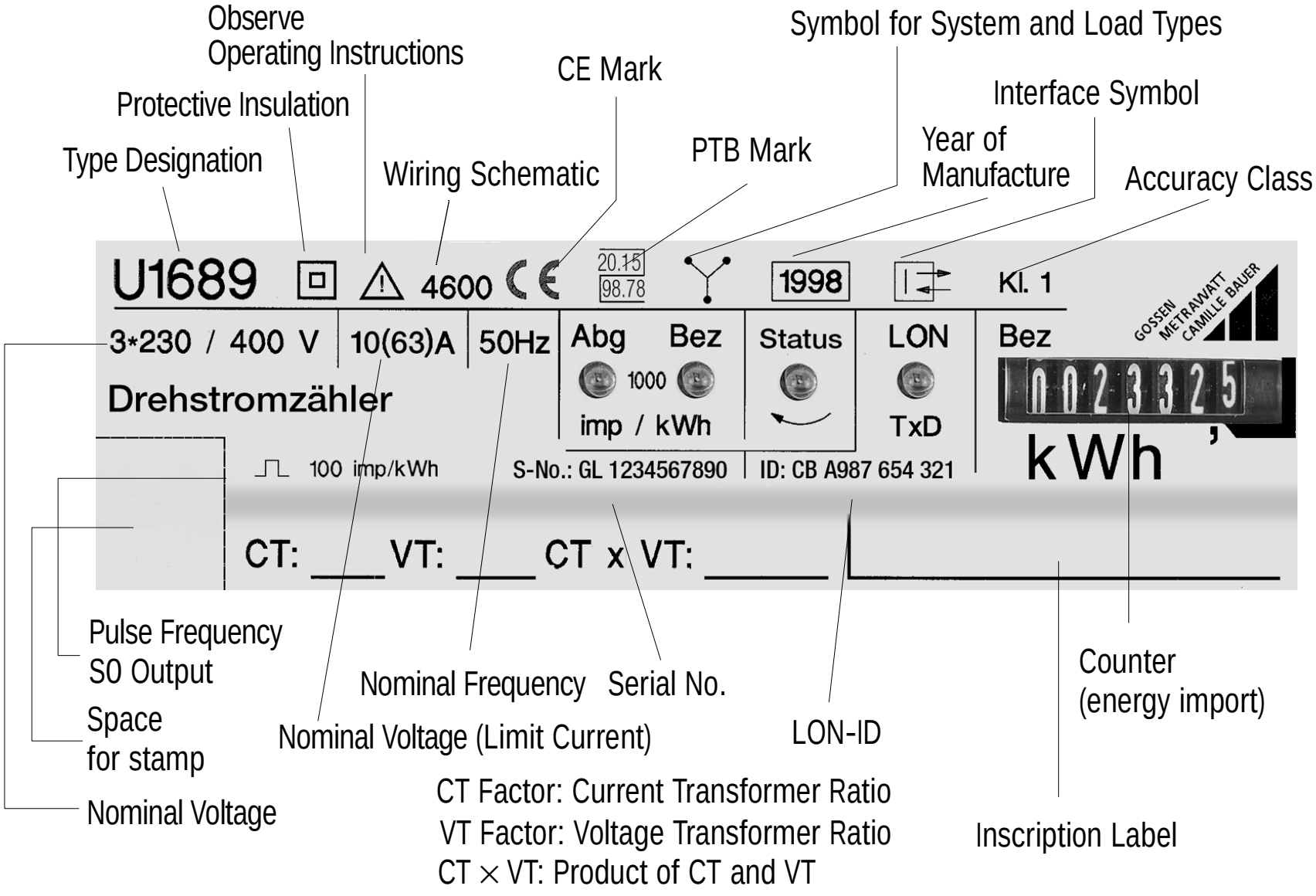
- Check mains voltage before placing your meter into operation, see serial plate.

- Make certain that connection cables are not damaged, and that they are free of voltage during hook-up of the meter.

- If it may be assumed that the instrument can no longer be operated safely, it must be removed from service (disconnect input voltage!). Safe operation can no longer be relied upon if the meter displays visible damage.
  Placing the meter back into operation is only permitted after the error has been detected, the meter has been repaired and subsequent testing of calibration and dielectric strength has been carried out at our plant or at an authorized service center.

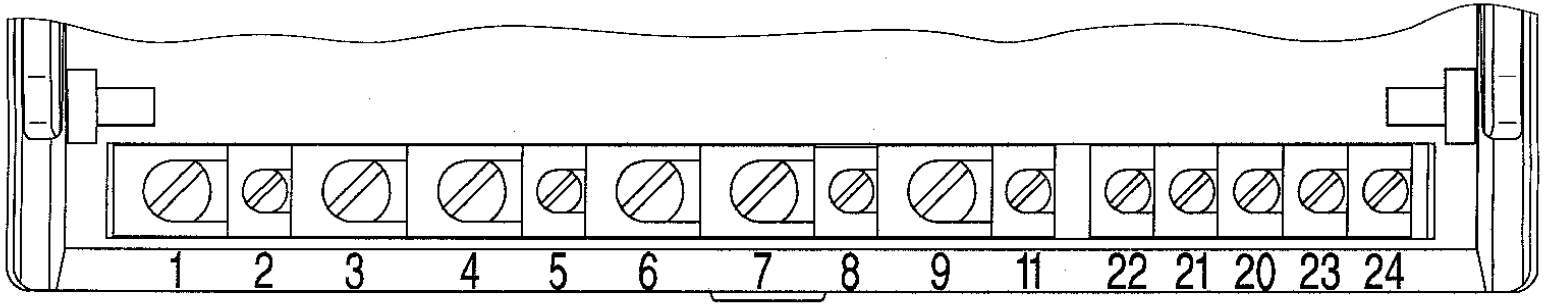
- When the cover is opened voltage conducting parts may be exposed. If balancing, maintenance or repair of a live, open instrument is required, this may only be carried out by trained personnel who are familiar with the dangers involved.
  Capacitors within the meter may still be charged, even after it has been disconnected from all voltage sources.

- Insulation must be high-voltage tested with the values indicated under technical data after the meter has been repaired or serviced, and after the cover has been closed.


Observe
Operating Instructions
Protective Insulation
Type Designation
Wiring Schematic
CE Mark
PTB Mark
Symbol for System and Load Types
Interface Symbol
Year of
Manufacture
Accuracy Class
U1689
4600
20.15
98.78
1998
Kl. 1
3*230 / 400 V
10(63)A
50Hz
Abg
Bez
1000
imp / kWh
Status
LON
TxD
Bez
GOSSEN METRAWATT CAMILLE BAUER
0 0 2 3 2 5
kWh
Drehstromzähler
100 imp/kWh
S-No.: GL 1234567890
ID: CB A987 654 321
CT: ___ VT: ___ CT x VT: ___
Pulse Frequency
S0 Output
Space
for stamp
Nominal Voltage
Nominal Voltage (Limit Current)
Nominal Frequency
Serial No.
LON-ID
Counter
(energy import)
CT Factor: Current Transformer Ratio
VT Factor: Voltage Transformer Ratio
CT × VT: Product of CT and VT
Inscription Label

Note: Observe the connection schematic in the terminal cover.

Attention: Tighten screws by hand only! Tightening torque
for current terminals (no. 1, 3, 4, 6, 7 and 9) = 2 Nm
and for all other terminals (no. 2, 5, 8, 11, 20 ... 24) = 0.4 Nm



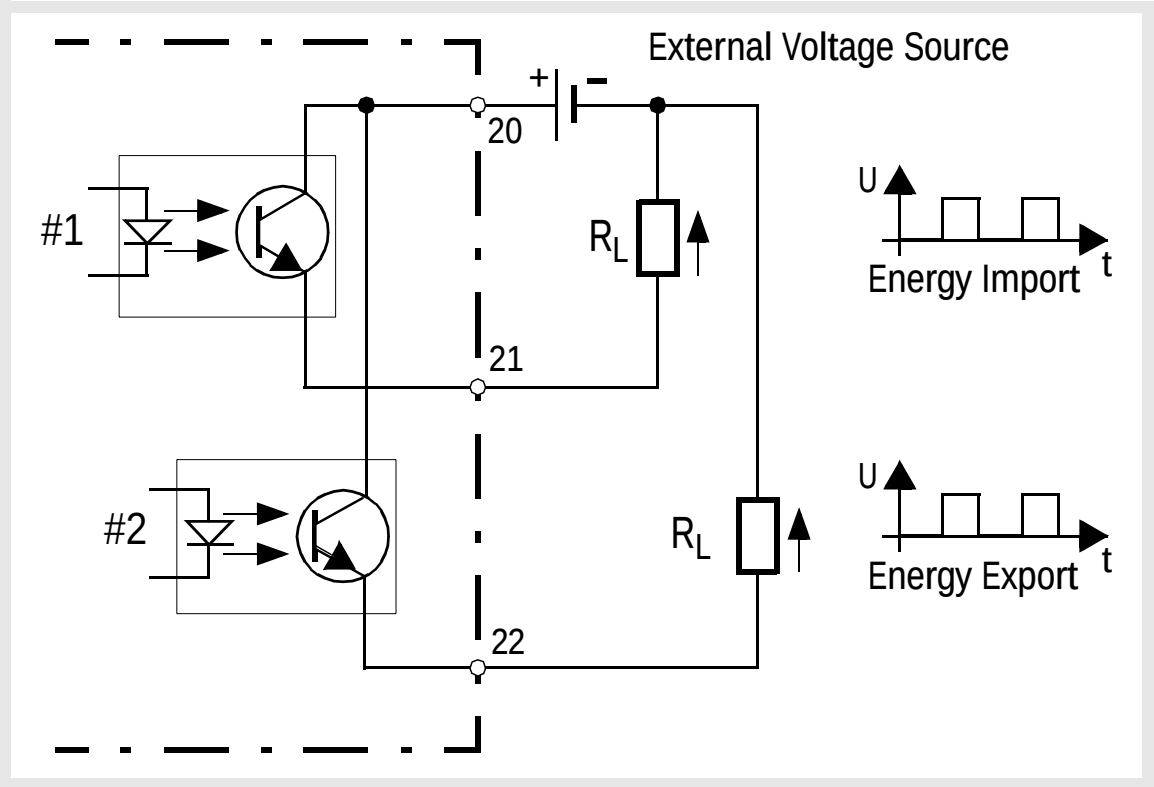
Current: ≤ 16 mm² without connector sleeve

Voltage: ≤ 2,5 mm² with connector sleeve or
≤ 2 x 1.5 mm² without connector sleeve

≤ 2,5 mm² mit with connect. sleeve or
≤ 2 x 1.5 mm² without connect. sleeve

3 Pulse Output

Electrical Values	
Pulse Duration Interpulse Period	100 ms + 50% > 50 ms
U_{ext}	max. 40 V
Switching Current	max. 27 mA



4 LED

The Status LED lights up briefly each time the counter is activated. The LED blinks with approx. 1 Hz to indicate incorrect phase sequencing (4-wire three-phase current only), and lights up or “flickers periodically” to indicate phase failure (3- or 4-wire).
The Bez LED blinks to indicate energy import.
The Abg LED blinks to indicate energy export.
The LON LED shows thefunction of the LON bus.

The start-up LED left from the counter (meters without LON bus only) allows for a accelerated start-up and open-circuit test.

5 LON

5.1 Cable Lengths for LON Bus Connections

Double End Bus Termination and Bus Network Wiring		
Cable Type	Max. Bus Length for use with FTT-10 or FTT-10A transceiver	Max. Bus Length for use with FTT-10, FTT-10A and LPT-10 transceiver
Belden 85102	2700 m	2200 m
Belden 8471	2700 m	2200 m
Level IV, 22 AWG	1400 m	1150 m
JY (St) Y 2 x 2 x 0.8	900 m	750 m

Single End Bus Termination and Point-to-Point Wiring		
Cable Type	Max. Bus Length from node to node	Max. Overall Bus Length
Belden 85102	500 m	500 m
Belden 8471	400 m	500 m
Level IV, 22 AWG	400 m	500 m
JY (St) Y 2 x 2 x 0.8	320 m	500 m

5.2 System State Variables

Status

A node responds to the query nviRequest by sending its status (status and error bits) to the network as system state variable nvoStatus.

The following bits are used:

unsigned out_of_limits	becomes 1	where P > Pmax
unsigned open_circuit	becomes 1	for phase failure
unsigned electrical_fault	becomes 1	for incorrect phase sequence
unsigned fail_self_test	becomes 1	for internal error

Transmission Conditions for System State Variables

The transmission status for a new value is determined via MaxSendTime, MinSendTime and MinDelta. A new value is only transmitted if its deviation from the last value is equal to at least MinDelta, and if MinSendTime has elapsed. If a value is not changed, or if its change does not exceed the MinDelta threshold, it is transmitted after MaxSendTime.

Measurement Value Storage

If system status variable nvi01SetTime is transmitted to the meter, the meter stores its current readings together with a time stamp to permanent internal memory.

Nodes

nv#	System State Variable	Data Type	Comment
0	nviRequest	SNVT_obj_request	status query
1	nvoStatus	SNVT_obj_status	status message
2	nvo00NodeType	SNVT_str_asc	device type
3	nvo00Version	SNVT_count	software version
4	nvo00Date	SNVT_time_stamp	date of manufacture
5	nvo00Voltage	SNVT_volt	Ur
6	nvo00Current	SNVT_amp	Ib
7	nci00StsMaxSendT	SNVT_elapsed_tm	adjustable from 1 s ... 18 hr.

Energy Meter with Pulse Output

nv#	System State Variable	Data Type	Comment
8	nvo01EnergyInL	signed long whr	energy import in Wh
9	nvo01EnergyInF	SNVT_elec_whr_f	energy import in Wh
10	nvo01EnergyOutL	signed long whr	energy export in Wh
11	nvo01EnergyOutF	SNVT_elec_whr_f	energy export in Wh
12	nvo01PulseRate	SNVT_count	1 ... 10000 pulses / kWh for pulse outputs
13	nvi01SetTime	SNVT_time_stamp	time stamp triggers storage of meter readings
14	nvo01TimeStamp	SNVT_time_stamp	time stamp
15	nvo01EnergyInLp	signed long whr	energy import in Wh at time of nvo01TimeStamp
16	nvo01EnergyInFp	SNVT_elec_whr_f	energy import in Wh at time of nvo01TimeStamp
17	nvo01EnergyOutLp	signed long whr	energy export in Wh at time of nvo01TimeStamp
18	nvo01EnergyOutFp	SNVT_elec_whr_f	energy export in Wh at time of nvo01TimeStamp
19	nci01MaxSendT	SNVT_elapsed_tm	adjustable from 1 s ... 18 hr.
20	nci01MinSendT	SNVT_elapsed_tm	adjustable from 1 s ... 18 hr.
21	nci01MinDeltaF	SNVT_elec_whr_f	measurement value deviation adjustable from 1 Wh ... 1 MWh

Power Meter

nv#	System State Variable	Data Type	Comment
22	nvo02Power	SNVT_power_f	instantaneous power
23	nci02MaxSendT	SNVT_elapsed_tm	adjustable from 1 s ... 18 hr.
24	nci02MinSendT	SNVT_power_f	adjustable from 1 s ... 18 hr.
25	nci02MinDelta	SNVT_power_f	measurement value deviation adjustable from 1 W ... 100 kW

Status Query Object

Definition	Node	Energymeter	Powermeter
object_id	0000	0001	0002
object_request Code	00	00	00
	02	02	02
	05	05	05

object_request Code:

00	RQ_NORMAL	supplies status message for the chosen object (see following page)
02	RQ_UPDATE_STATUS	supplies status message for the chosen object (see following page)
05	RQ_REPORT_MASK	supplies bit mask of the bits used for the chosen object

Status Message

Bit Number.	Definition	Description
31	invalid_id	invalid object_id
30	invalid_rq	invalid object_request Code
28	out_of_limits	P > Pmax
27	open_circuit	phase failure
21	electrical_fault	rotating field error
18	fail_self_test	Internal error
12	report_mask	mask of supported status bits

6 Power Consumption

Voltage Circuit	
2-Wire Meter 3 and 4-Wire Meters	< 5 VA < 3 VA per phase
Current Circuit	
at I_{max} at I_B = 1 A at I_B = 5 A at I_B = 10 A	< 1 VA < 0.05 VA < 0.5 VA < 0.02 VA

7 Mounting the Terminal Cover

If the terminal cover is open, it can be easily removed or installed. The terminal cover must be swung out 90° from its closed position. The side panels can then be lifted, one after the other, with the guide slots over the fixed axle studs.

8 Inscription Label

The CT and VT factors, as well as their product types, can be entered onto the inscription label beneath the serial plate (see serial plate key on page 3). To this end, the inscription label can be withdrawn from the corresponding slot, provided the terminal cover is open.

9 Sealing

9.1 Housing Seal

The housing seal is attached to the back panel of the housing. Two drill holes are provided for this purpose, which are located above the hole pattern.
Repairs within the housing may only be undertaken by GOSSEN-METRAWATT service or authorized service centers.

9.2 Terminal Cover Seal

The terminal cover seal is attached at the left or the right hand side of the terminal cover.

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