

EMBSIN

Measuring transducers for electrical variables



MBS's measuring transducers of the type EMBSIN transforms an input alternating voltage and/or an input alternating current, received as a standard signal from a current transformer, – or voltage transformer, or from the power system, into a load imprinted output voltage.

The various EMBSIN units are arranged to collate all measuring variables, which are necessary to monitor and to control, the power supply and consumption, to display the output signals, or to accept these into other units of the measuring- and control technic.

Several units such as indicators, recorders or signal processing systems can be connected to the output. The transducer's configuration assures a safe deviation for all functions for a galvanic separation between inputs and outputs. The most important applications for the transducers are in the generation and distribution of energy, in the manufacturing industry, and panel building enterprises.

The transducers have been developed upon an entirely new housing technology concept and are available in 5 different sizes.

The housing material made of high quality polycarbonate are **free of silicon as well as halogen** and, are flame resistant. High quality screw terminals are provided for the safe connections of inputs and outputs. Fitment onto the base wall is made with a 35 mm DIN rail. All electrical connections are made at the top of the units for safe and easy access.

The transducers bear the CE symbol. This symbol provides the highest level of protection for humans, the machine, as well as the environment, and of course, comply with all applicable safety regulations. MBS's production of high current measuring transducers, made of the finest quality enjoy a long tradition and a distinguished world wide reputation. The encapsulated housing design, the carefully chosen material and the construction principles, contribute that the measuring transducers are protected against climatic conditions (temperature and humidity), atmospheric conditions (chemical processes, dust and salt), vibration and shocks, interruptions (electrical or mechanical), HF interferences (communications) as well as permanent or transient interference voltages on all electrical connections.

• Compact • Safety • Easy to use • Accurate • Better

Safety

EN 61010 also on the terminals!
690 V max. input voltage
housing material: Polycarbonate
fire resistance class: V-0 acc. to UL94
(self-extinguishing, halogen-free, silicon-free)

Easy to use

Units with two wide-and auxiliary power ranges
24 ... 65 V AC/DC or 85 ... 230 V AC/DC auxiliary
power, to be connected either on the top or on the bot-
tom cos φ or linear recalibrating/ can be synchronized
without opening the unit and without AC calibrators!
mounting onto 35 mm DIN rail
operating instructions are included

Compact

height 75 mm, V-series
height 60 mm
depth 105 mm, V-series
depth 112 mm
width 45 mm, V-series
width 105 mm for power,
70 mm for frequency and phase as well as
U and I with wide-range auxiliary
power
35 mm two-wire feed 24 V DC or 230 V AC
35 mm for current and voltage without
auxiliary power supply
100 mm EMBSIN 391 PV

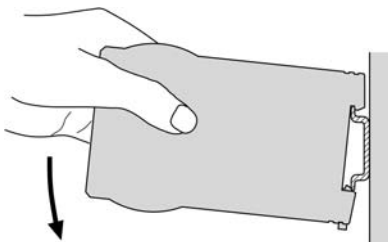
Accuracy

All units class 0.5
EMBSIN 241 FV class 0.2
EMBSIN 241 F class 0.2
EMBSIN 241 FD class 0.2

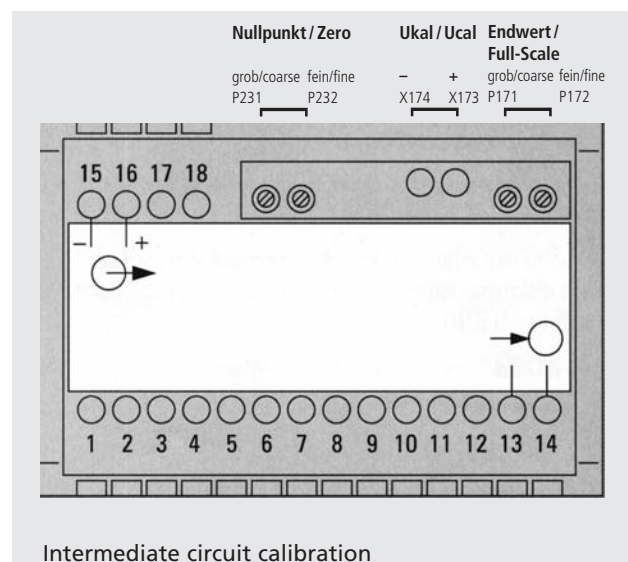
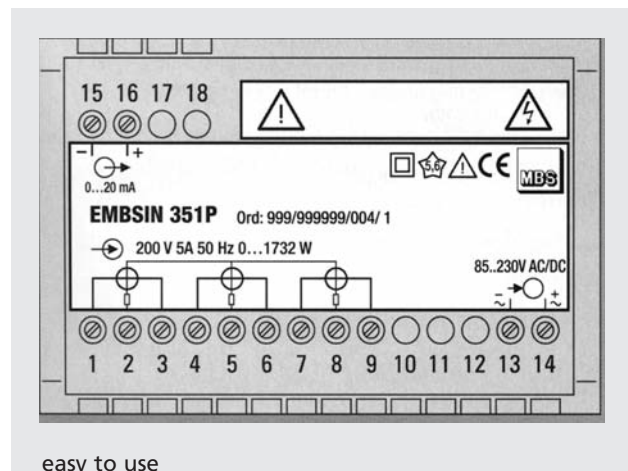
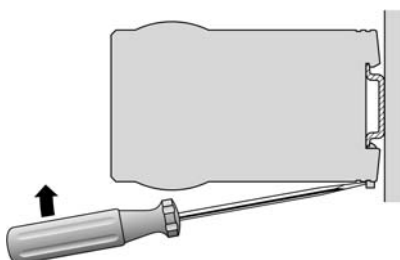
Better

Highest quality and safety at very competitive prices

assembly



dismantling



Standard Units

EMBSIN 100 I	Measuring transducer for AC current, without auxiliary voltage supply	288
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Standard Units

EMBSIN 100 I Measuring transducer for alternating current, without auxiliary voltage, with 2 measuring ranges

Construction	Rated frequency	Measuring range	Output signal	Art.-no.
		0 ... 1.0 A / 5 A	0 ... 5 mA	127 698
housing		0 ... 1.0 A / 5 A	0 ... 10 mA	127 705
MBS	50/60 Hz	0 ... 1.0 A / 5 A	0 ... 20 mA	127 713
for 35 mm		0 ... 1.2 A / 6 A	0 ... 5 mA	127 721
DIN rail		0 ... 1.2 A / 6 A	0 ... 10 mA	127 739
		0 ... 1.2 A / 6 A	0 ... 20 mA	127 747

EMBSIN 101 I Measuring transducer for alternating current, with auxiliary voltage

Construction	Rated frequency	Measuring range	Output signal	Auxiliary voltage	Art.-no.
		0 ... 1 A	0 ... 20 mA	230 V AC	128 290
		0 ... 5 A	0 ... 20 mA	230 V AC	128 307
housing		0 ... 1 A	4 ... 20 mA	230 V AC	128 331
MBS	50/60 Hz	0 ... 5 A	4 ... 20 mA	230 V AC	128 349
for 35 mm		0 ... 1 A	0 ... 20 mA	24 V DC	128 315
DIN rail		0 ... 5 A	0 ... 20 mA	24 V DC	128 323
		0 ... 1 A	4 ... 20 mA, 2-wire	24 V DC	128 357
		0 ... 5 A	4 ... 20 mA, 2-wire	24 V DC	128 365

EMBSIN 201 IE Measuring transducer for alternating current, with auxiliary voltage, with 2 measuring ranges, effective value measuring

Construction	Rated frequency	Measuring range	Output signal	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
housing		0 ... 1.0 A / 5 A	0 ... 20 mA		128 232
MBS		0 ... 1.0 A / 5 A	4 ... 20 mA	85 ... 230 V	128 240
for 35 mm	50/60 Hz	0 ... 1.2 A / 6 A	0 ... 20 mA		128 258
DIN rail		0 ... 1.2 A / 6 A	4 ... 20 mA		128 266

Response time of the output value: 300 ms

EMBSIN 120 U Measuring transducer for alternating voltage, without auxiliary voltage supply

Construction	Rated frequency	Measuring range	Output signal	Art.-no.
		0 ... 100 / $\sqrt{3}$ V	0 ... 5 mA	127 854
		0 ... 100 / $\sqrt{3}$ V	0 ... 20 mA	127 862
		0 ... 110 / $\sqrt{3}$ V	0 ... 5 mA	127 870
		0 ... 110 / $\sqrt{3}$ V	0 ... 20 mA	127 888
housing		0 ... 100 V	0 ... 5 mA	127 896
MBS		0 ... 100 V	0 ... 20 mA	127 903
for 35 mm	50/60 Hz	0 ... 110 V	0 ... 5 mA	127 911
DIN rail		0 ... 110 V	0 ... 20 mA	127 929
		0 ... 120 V	0 ... 5 mA	127 953
		0 ... 120 V	0 ... 20 mA	127 961
		0 ... 250 V	0 ... 5 mA	127 937
		0 ... 250 V	0 ... 20 mA	127 945
		0 ... 500 V	0 ... 5 mA	127 979
		0 ... 500 V	0 ... 20 mA	127 987

Standard Units

EMBSIN 121 U Measuring transducer for alternating voltage, with auxiliary voltage supply

Construction	Rated frequency	Measuring range	Output signal	Auxiliary voltage	Art.-no.
		0 ... 100 V	0 ... 20 mA	230 V AC	127 341
		0 ... 250 V	0 ... 20 mA	230 V AC	127 359
housing		0 ... 500 V	0 ... 20 mA	230 V AC	127 383
MBS	50/60 Hz	0 ... 100 V	0 ... 20 mA	24 V DC	127 367
for 35 mm		0 ... 250 V	0 ... 20 mA	24 V DC	127 375
DIN rail		0 ... 100 V	4 ... 20 mA, 2-wire	24 V DC	127 391
		0 ... 250 V	4 ... 20 mA, 2-wire	24 V DC	127 408
		0 ... 500 V	4 ... 20 mA, 2-wire	24 V DC	127 416

EMBSIN 221 UE Measuring transducer for alternating voltage, with auxiliary voltage supply, effective value measuring

Construction	Rated frequency	Measuring range	Output signal	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
		0 ... 100 V	0 ... 20 mA		127 440
		0 ... 100 V	4 ... 20 mA		127 458
housing		0 ... 120 V	0 ... 20 mA		127 466
MBS	50/60 Hz	0 ... 120 V	4 ... 20 mA	85 ... 230 V	127 474
for 35 mm		0 ... 250 V	0 ... 20 mA		127 507
DIN rail		0 ... 250 V	4 ... 20 mA		127 515
		0 ... 500 V	0 ... 20 mA		127 482
		0 ... 500 V	4 ... 20 mA		127 490

response time of the output signal: 300 ms

EMBSIN 241 F Measuring transducer for frequency, with auxiliary voltage supply

Construction	Input voltage	Measuring range	Output signal	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
		45 ... 55 Hz	0 ... 20 mA		127 549
	10 ... 230 V	45 ... 55 Hz	4 ... 20 mA		127 557
housing		48 ... 52 Hz	0 ... 20 mA		127 573
MBS		48 ... 52 Hz	4 ... 20 mA	85 ... 230 V	127 565
for 35 mm		45 ... 55 Hz	0 ... 20 mA		127 581
DIN rail	230 ... 690 V	45 ... 55 Hz	4 ... 20 mA		127 606
		48 ... 52 Hz	0 ... 20 mA		127 599
		48 ... 52 Hz	4 ... 20 mA		127 614

response time of the output volume: 4 periods of the input frequency

EMBSIN 281 G Measuring transducer for active power factor, with auxiliary voltage supply

Construction	Input volumes	Output signal	Application	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
housing	230 V AC (L1-N)	0 ... 20 mA	single-phase		127 648
MBS	and 5 A (L1)	4 ... 20 mA	alternating current	85 ... 230 V	127 664
for 35 mm	400 V AC (L1-L2)	0 ... 20 mA	3- or 4-wire		127 656
DIN rail	and 5 A (L1)	4 ... 20 mA	direct current, balanced load		127 672

response time of the output volume: 4 periods of the input frequency
 rated frequency of the input volume: 50 Hz
 measuring range: 0.5...cap...1...ind...0.5 cos phi
 output volume: proportional cos phi

Standard Units

EMBSIN 351 P Measuring transducer for active power, with auxiliary voltage supply

Construction	Measuring inputs	Output signal	Application	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
housing	U_n : L ₁ , L ₂ , L ₃ I_n : L ₁	4 ... 20 mA	3-wire direct current balanced load		137 770
MBS	U_n : L ₁ , L ₂ , L ₃ I_n : L ₁ and L ₃	4 ... 20 mA	3-wire direct current unbalanced load	85 ... 230 V	137 788
for 35 mm DIN rail	U_n : L ₁ , L ₂ , L ₃ I_n : L ₁ , L ₂ , L ₃	4 ... 20 mA	4-wire direct current unbalanced load		137 796

input rated voltage U_n : 400 V (linked voltage!)
 input rated current: 5 A
 rated frequency measuring input: 50 Hz
 measuring range: 0 ... 2 kvar

EMBSIN 361 Q Measuring transducer for re-active power, with auxiliary voltage supply

Construction	Measuring inputs	Output signal	Application	Auxiliary voltage DC or AC 40...400 Hz	Art.-no.
housing					
MBS	U_n : L ₁ , L ₂ , L ₃ I_n : L ₁ and L ₃	4 ... 20 mA	3-wire alternating current unbalanced load	85 ... 230 V	137 803
for 35 mm DIN rail					

input rated voltage U_n : 400 V (linked voltage!)
 input rated current: 5 A
 rated frequency measuring input: 50 Hz
 measuring range: 0 ... 2 kvar

Order Lists

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Order Lists

EMBSIN 100 IV – Measuring transducer for AC current, without auxiliary voltage supply

Features	Order no.				
EMBSIN 100 IV, measuring transducer for AC current order no.: 100 I - Vxxx	100 I -	V	X	X	X
1. construction housing MBS, for 35 mm DIN rail		V			
2. measuring range 0 ... 1 A			1		
0 ... 5 A			2		
nonstandard [A], 0 ... 1 A to 0 ... 7.5 A _____ A			9		
3. output signal 0 ... 5 mA				1	
0 ... 10 mA				2	
0 ... 20 mA				3	
4. additional text on the label without additional text					0
with additional text					1

rated frequency of the measuring signal: 50/60 Hz

EMBSIN 100 I – Measuring transducer for AC current, without auxiliary voltage supply

Features	Order no.				
EMBSIN 100 I, measuring transducer for AC current order no.: 100 I - Mxxxx	100 I -	M	X	X	X
1. construction housing MBS, for 35 mm DIN rail		M			
2. measuring range 0 ... 1 / 5 A			1		
0 ... 1.2 / 6 A			2		
9) nonstandard [A] 0 ... 0.5 A to 0 ... 7.5 A (only one measuring range!) _____ A			9		
3. output signal 0 ... 5 mA, Ra <= 3 kOhm				1	
0 ... 10 mA, Ra <= 1.5 kOhm				2	
0 ... 20 mA, Ra <= 750 Ohm				3	
4. measuring range adjustable measuring range fixed					0
measuring end value adjustable approx. ± 10 %					1
5. test certificates without test certificate					0
with test certificate in German					D
with test certificate in English					E

rated frequency of the measuring signal: 50/60 Hz

Order Lists

EMBSIN 101 I – Measuring transducer for alternating current EMBSIN 121 U – Measuring transducer for alternating voltage

Features	Order no.							
EMBSIN 101 I , measuring transducer for AC current order no.: 101 I - Mxx xxx	101 I -	M	X	X		X	X	X
EMBSIN 121 U, measuring transducer for AC voltage order no.: 121 U - Mx xxxx	121 U-	M	X		X	X	X	X
1. construction housing MBS / SP1, for 35 mm DIN rail		M						
2. frequency of the input voltage / input current rated frequency 50 / 60 Hz			1					
3. measuring range								
0 ... 1 A				A				
0 ... 5 A				B				
Z: _____ A				Z				
! Z: Nonstandard [A] : 0 ... 0.8 to 0 ... 1.2 or 0 ... 4 to 0 ... 6								
0 ... 100 V				A				
0 ... 250 V				B				
Z: _____ V				Z				
! Z: Nonstandard [V] : 0 ... 50 to 0 ... 500								
max. 300 V rated voltage to earth (rated voltages acc. to EN 61010)								
4. output signal								
0 ... 20 mA						1		
4 ... 20 mA						2		
4 ... 20 mA , 2-wire connection / feed						3		
9: _____ mA						9		
! 9: Nonstandard [mA] : 0 ... 2.5 to 0 ... < 20								
0 ... 10 V						A		
Z: _____ V						Z		
1 ... 5 to < (4... 20)								
! Z: Nonstandard [V] : 0 ... 5.0 to 0 ... < 10								
1 ... 5 to 2 ... 10								
5. auxiliary power								
auxiliary voltage Uh : 24 V AC						1		
auxiliary voltage Uh : 110 V AC						2		
auxiliary voltage Uh : 115 V AC						3		
auxiliary voltage Uh : 120 V AC						4		
auxiliary voltage Uh : 230 V AC						5		
auxiliary voltage Uh : 400 V AC, ! max. 300 V to earth!						6		
auxiliary voltage Uh : 24 V DC						A		
auxiliary voltage Uh : 24 V DC via output circuit						B		
universal power supply 85 ... 230 V AC/DC						C		
universal power supply 24 ... 60 V AC/DC						D		
Uh ... rated voltage, permissible tolerances								
AC : - 15 % ... + 15 %								
DC : - 15 % ... + 33 %								
for DC via output circuit: - 50 % ... + 33 %								
! 1 to A not to be combined with output signal, order-no.: 3								
! B not to be combined with output signal, order no.: 1, 2, 9, A, Z								
6. test certificates								
without test certificate							0	
with test certificate in German							D	
with test certificate in English							E	

Order Lists

EMBSIN 201 IEV – Measuring transducer for alternating current, true rms measuring
EMBSIN 221 UEV – Measuring transducer for alternating voltage, true rms measuring

Features	Order no.											
EMBSIN 201 IEV, measuring transducer for AC current effective value, order no.: 201 IE - Vxxxxxxx	201 IE -	V	X		X	X	X	X	X	X	X	X
EMBSIN 221 UEV, measuring transducer for alternating voltage effective value, order no.: 221 UE - Vxxxxxxx	221 UE -	V		X	X	X	X	X	X	X	X	X
1. construction housing MBS, for 35 mm DIN rail		V										
2. measuring range												
0 ... 1 A			1									
0 ... 5 A			2									
9) _____ A												
! 9) 0 ... 0.2 A to 0 ... 6 A			9									
0 ... 50 V				A								
0 ... 500 V				B								
Z) _____ V												
! Z) 0 ... 50 V to 0 ... 500 V				Z								
3. output signal												
mA				1								
V				2								
4. output signal, start value												
output unipolar, start value 0				1								
output live-zero, start value 20 %				2								
5. output signal, end value												
output signal end value: 20 mA				1								
output signal end value: 1 ... 20 mA, _____ mA				9								
output signal end value: 10 V				A								
output signal end value: 1 ... 10 V, _____ V				Z								
6. auxiliary voltage												
universal power supply 24 ... 300 V DC/ 40 ... 276 V AC								1	0			
AC power supply								2				
57 V									1			
100 V									3			
110 V									4			
230 V									5			
400 V									7			
500 V									8			
7. type of serial interface												
without interface										0		
RS 232										1		
RS 485										2		
8. type of output characteristics												
linear											L	
curved (1)											B	

(1) Please take notice of the additional information in table 2 when ordering curved output characteristics.

Order Lists

EMBSIN 201 IEV – Measuring transducer for alternating current, true rms measuring EMBSIN 221 UEV – Measuring transducer for alternating voltage, true rms measuring

Table 2

Additional information when ordering measuring transducers with curved output characteristics

When ordering measuring transducers with curved output characteristics the start and end points as well as the position of the required curved break of the to be adjusted transmission ratio have to be defined.

Measuring transducers of the type **EMBSIN 201 IEV / EMBSIN 221 UEV** allow the presentation of transmission characteristics of up to 5 curved breaks.

Description		Code
start value of the measuring value(s)	dependent on the measuring range	s
	0 ... +20 mA / 0 V ... +10 V	
start value of the output value	dependent on the output range	p
	$0 \leq p \leq +20 \text{ mA} / 0 \leq p \leq +10 \text{ V}$	
end value of the measuring value (s)	dependent on the measuring range	e
end value of the output value (rt) if measuring value (e)	1 mA ... +20 mA / 1 V ... +10 V	
	dependent on the output range	rt
value of the measuring value (n_x)	dependent on the measuring range	n_1 _____
		n_2 _____
		n_3 _____
		n_4 _____
		n_5 _____
value of the output value (o_x) if measuring value (n_x)	0 mA ... +20 mA / 0 V ... +10 V dependent on the output range $0 \leq p \leq +20 / 0 \leq p \leq +10$	o_1 _____
		o_2 _____
		o_3 _____
		o_4 _____
		o_5 _____

Order Lists

EMBSIN 201 IE – Measuring transducer for alternating current

EMBSIN 221 UE – Measuring transducer for alternating voltage

Features	Order no.									
EMBSIN 201 IE, measuring transducer for alternating current effective value, order no.: 201 IE - Mxx xx x	201 IE -	M	X	X		X	X		X	X
EMBSIN 221 UE, measuring transducer for alternating voltage effective value, order no.: 221 UE - Mx xx xx	221 UE-	M	X		X	X		X	X	X
1. construction housing MBS, for 35 mm DIN rail		M								
2. frequency of the input current/ input voltage										
rated frequency 50/60 Hz			1							
rated frequency 400 Hz			2							
3. measuring range										
0 ... 1.0 / 5.0 A			1							
0 ... 1.2 / 6.0 A			2							
9: _____ / _____ A			9							
Lower/higher measuring range dependent on connection availability										
! 9: nonstandard [A]: 0 ... 0.1 / 0.5 to 0 ... < 1.2 / 6										
measuring range end value ratio 1 : 5										
0 ... 100 / $\sqrt{3}$ V					A					
0 ... 110 / $\sqrt{3}$ V					B					
0 ... 100 V					C					
0 ... 110 V					D					
0 ... 116.66 V					E					
0 ... 120 V					F					
0 ... 125 V					G					
0 ... 133.33 V					H					
0 ... 150 V					J					
0 ... 250 V					K					
0 ... 500 V !					L					
Z) _____ V					Z					
! Z: Nonstandard [V]: 0 ... 20 to 0 ... 690 *										
with auxiliary voltage from measuring input min. 24V/ max. 230V										
see selection criteria 5 digit 3+4										
! * > 400 V only linked voltage!										
4. output signal										
0 ... 20 mA					1					
4 ... 20 mA					2					
9: _____ mA					9					
0 ... 10 V					A					
Z: _____ V					Z					
! 9) Nonstandard [mA]: 0 ... 1.00 to 0 ... < 20										
0.2 ... 1 to < (4 ... 20)										
! Z) Nonstandard [V]: 0 ... 1.00 to 0 ... < 10										
0.2 ... 1 to 2 ... 10										
5. auxiliary voltage										
U _h : 85 ... 230 V AC/DC					1	1				
U _h : 24 ... 60 V AC/DC					2	2				
from measuring input (>= 24 ... 60 V AC)						3				
from measuring input (>= 85...230 V AC)						4				
U _h : 24 V AC/ 24 ... 60 V DC					5	5				
from low voltage area										
U _h = rated voltage										
tolerances: DC -15 ... +33 %, AC -15 ... +15 %										
! 3 not to be combined with measuring range order no.: C ... L										
! 4 not to be combined with measuring range order no.: A , B, L										
6. response time										
300 ms, standard								1		
50 ms								2		
7. test certificates										
without test certificate									0	
with test certificate in German									D	
with test certificate in English									E	

Order Lists

EMBSIN 120 UV - Measuring transducer for alternating voltage, without auxiliary voltage supply

Features	Order no.				
EMBSIN 120 UV, measuring transducer for alternating voltage order no.: 120 U - Vxxx	120 U -	V	X	X	X
1. construction housing MBS, for 35 mm DIN rail		V			
2. measuring range					
0 ... 100 / $\sqrt{3}$ V			1		
0 ... 110 / $\sqrt{3}$ V			2		
0 ... 100 V			3		
0 ... 110 V			4		
0 ... 250 V			6		
0 ... 500 V !			8		
9: _____ V					
! 9: Nonstandard [V] 0 ... 20 to 0 ... 500 V					
! max. 250 V rated voltage to earth, working voltage acc. to EN 61010!			9		
3. output signal					
0 ... 5 mA				1	
0 ... 10 mA				2	
0 ... 20 mA				3	
4. additional text on the label					
without additional text					0
with additional text					1

rated frequency of the measuring signal: 50 / 60 Hz

EMBSIN 120 U - Measuring transducer for alternating voltage, without auxiliary voltage supply

Features	Order no.					
EMBSIN 120 U, measuring transducer for alternating voltage order no.: 120 U - Mxxxx	120 U -	M	X	X	X	X
1. construction housing MBS, for 35 mm DIN rail		M				
2. measuring range						
0 ... 100 / $\sqrt{3}$ V			A			
0 ... 110 / $\sqrt{3}$ V			B			
0 ... 120 / $\sqrt{3}$ V			C			
0 ... 100 V			D			
0 ... 110 V			E			
0 ... 116.66 V			F			
0 ... 120 V			G			
0 ... 125 V			H			
0 ... 133.33 V			J			
0 ... 150 V			K			
0 ... 250 V			L			
0 ... 400 V			M			
0 ... 500 V			N			
Z: _____ V			Z			
! Z: Nonstandard [V] 0...20 to 0...500 V						
! max. 250 V rated voltage to earth, working voltage acc. to EN 61010!						
3. output signal						
0 ... 5 mA, $R_a \leq 3 \text{ k}\Omega$				1		
0 ... 10 mA, $R_a \leq 1.5 \text{ k}\Omega$				2		
0 ... 20 mA, $R_a \leq 750 \text{ }\Omega$				3		
4. measuring range adjustable						
measuring range fixed					0	
measuring end value adjustable approx. $\pm 10 \%$					1	
5. test certificates						
without test certificate						0
with test certificate in German						D
with test certificate in English						E

Order Lists

EMBSIN 241 FV - Measuring transducer for frequency

Features	Order no.									
EMBSIN 241 FV, measuring transducer for frequency order no.: 241 F - Vxxxxxxx	241 F-	V	X	X	X	X	X	X	X	X
1. construction housing MBS, for 35 mm DIN rail		V								
2. measuring range										
40 ... 70 Hz			1							
45 ... 55 Hz			2							
48 ... 52 Hz			3							
45 ... 65 Hz			4							
55 ... 65 Hz			5							
9: (40 Hz ≤ 70 Hz) $f_a \leq f_e \leq 70$ Hz f_a _____ Hz f_e _____ Hz			9							
3. output signal										
mA			1							
V			2							
4. output signal, start value										
output signal unipolar, start value				1						
output signal live-zero, start value 20 %				2						
5. output signal, end value										
output signal, end value: 5 mA				1						
output signal, end value: 10 mA				2						
output signal, end value: 20 mA				3						
output signal, end value: 1 ... 20 mA, _____ mA				9						
output signal, end value: 10 V				A						
output signal, end value: 1 ... 10 V, _____ V				Z						
6. auxiliary voltage										
universal power supply					1	0				
AC power supply					2					
57 V						1				
100 V						3				
110 V						4				
230 V						5				
400 V						7				
500 V						8				
7. type of serial interface										
without interface								1		
RS232								2		
RS485								3		
8. type of output characteristics										
linear									L	
curved (1)									B	

(1) Please take notice of the additional information in table 2 when ordering curved output characteristics.

Table 2

Additional information when ordering measuring transducers with curved output characteristics

When ordering measuring transducers with curved output characteristics the start and end points as well as the position of the required curved break of the to be adjusted transmission ratio have to be defined. Measuring transducers of the type **EMBSIN 241 FV** allow the presentation of transmission characteristics of up to 5 curved breaks.

Description		Code
start value of the measuring value (s)	dependent on the measuring range	s
start value of the output value (p)	0 mA ... +20 mA / 0 V ... +10 V dependent on the output range $0 \text{ mA} \leq p \leq +20 \text{ mA} / 0 \leq p \leq +10 \text{ V}$	p
end value of the measuring value (e)	dependent on the measuring range	e
end value of the output value (rt) if measuring value (e)	1 mA ... +20 mA / 1 V ... +10 V dependent on the output range	rt
value of the measuring value (n_x)	dependent on the measuring range	$n_1 \dots n_5$
value of the output value (o_x) if measuring value (n_x)	0 mA ... +20 mA / 0 V ... +10 V dependent on the output range $0 \leq p \leq +20 / 0 \leq p \leq +10$	$o_1 \dots o_5$

Order Lists

EMBSIN 241 F - Measuring transducer for frequency

EMBSIN 241 FD - Measuring transducer for frequency difference

Features	Order no.									
EMBSIN 241 F, measuring transducer for frequency order no.: 241 F - Mxxxxxx	241 F -	M	X	X		X	X	X	X	
EMBSIN 241 FD, measuring transducer for frequency difference order no.: 241 FD - Mxxxxxx	241 FD-	M	X		X	X	X	X	X	
1. construction housing MBS, for 35 mm DIN rail		M								
2. rated nominal voltage 241 FD -> generator and bus bar input voltage 10 ... 230 V			1							
> 230 ... 690 V			2							
! Three-phase system: input voltage = linked voltage ! 2 not permissible by auxiliary voltage starting from measuring input										
3. measuring range 45 ... 50 ... 55 Hz				1						
47 ... 49 ... 51 Hz				2						
47.5 ... 50 ... 52.5 Hz				3						
48 ... 50 ... 52 Hz				4						
58 ... 60 ... 62 Hz				5						
9: _____ Hz				9						
! 9: nonstandard [Hz]; limit values: start value $f_a > = 10$ Hz, end value $f_e < = 1500$ Hz $f_a / (f_e - f_a) < 50$										
$f_s = 50$ Hz / $f_g = 49.5 ... 50 ... 50.5$ Hz				1						
$f_s = 50$ Hz / $f_g = 47.5 ... 50 ... 52.5$ Hz				2						
$f_s = 50$ Hz / $f_g = 45 ... 50 ... 55$ Hz				3						
$f_s = 50$ Hz / $f_g = 40 ... 50 ... 60$ Hz				4						
$f_s = 60$ Hz / $f_g = 57.5 ... 60 ... 62.5$ Hz				5						
9: _____ Hz				9						
! 9: Nonstandard [Hz]: upon request										
4. output signal 0 ... 20 mA				1						
4 ... 20 mA				2						
9: _____ mA				9						
0 ... 10 V				A						
Z: _____ V				Z						
! 9: Nonstandard [mA]: 0 ... 1.0 to 0 ... < 20 mA 1.0 ... 0 ... 1.0 to -20 ... 0 ... 20 mA 1 ... 5 to < (4 ... 20)										
! Z: Nonstandard [V] : 0 ... 1.0 to 0 ... < 10 V 0.2 ... 1 to 2 ... 10 V -1.0 ... 0 ... 1.0 to -10 ... 0 ... 10 V										
5. auxiliary voltage U_h : 85 ... 230 V AC/DC							1			
U_h : 24 ... 60 V AC/DC							2			
from measuring input ($\geq 24 ... 60$ V AC)							3			
from measuring input ($\geq 85 ... 230$ V AC)							4			
auxiliary voltage U_h : 24 V AC / 24 ... 60 V DC from low voltage side							5			
U_h = rated voltage tolerances: DC -15 ... +33 %, AC -15 ... +15 % ! 3 + 4 not to be combined with input rated voltage, order no. 2										
6. response time 4 periods of input frequency								1		
2 periods of input frequency								2		
8 periods of input frequency								3		
16 periods of input frequency								4		
! 1: 4 periods = standard										
7. test certificates without test certificate									0	
with test certificate in German									D	
with test certificate in English									E	

Order Lists

EMBSIN 271 G - Measuring transducer for phase angle EMBSIN 281 G - Measuring transducer for power factor

Features	Order no.											
EMBSIN 271 G, measuring transducer for phase angle order no.: 271 G - Mxxxxxxx	271 G-	M	X	X	X	X	X	X	X	X	X	X
EMBSIN 281 G, measuring transducer for power factor order no.: 281 G - Mxxxxxxx	281 G-	M	X	X	X	X	X	X	X	X	X	X
1. construction housing MBS, for 35 mm DIN rail		M										
2. type of measuring for phase angle (proportional phi)			1									
for power factor (proportional cos phi)			2									
3. application single-phase AC current			1									
3- or 4-phase DC current, balanced U:												
L1-L2; I : L1			2									
L2-L3; I : L2			3									
L3-L1; I : L3			4									
L1-L3; I : L1			5									
L2-L1; I : L2			6									
L3-L2; I : L3			7									
L1-L2; I : L3			A									
L2-L3; I : L1			B									
L3-L1; I : L2			C									
4. input rated frequency rated frequency 50 Hz			1									
rated frequency 60 Hz			2									
9: _____ Hz			9									
! 9: Nonstandard [Hz]: $10 \leq f_N \leq 400$												
by auxiliary voltage from measuring input min. 40 Hz												
5. input rated voltage input voltage U_N : 100 V			1									
input voltage U_N : 230 V			2									
9: input voltage U_N : _____ V			9									
! 3-wire system: U_N = linked voltage												
! 9: Nonstandard [V]: $> = 10$ to 690 V												
by auxiliary voltage from measuring input												
min. 24 V / max. 230 V, see selection criteria 9, digit 3 and 4												
6. input rated current I_N : 1 A			1									
I_N : 5 A			2									
9: I_N : _____ A ($> 0.5 \dots 6$ A)			9									
! 9: Nonstandard [A] upon request												
7. measuring range -60 ... 0 ... 60° el			1									
cos phi : 0.5 ... cap ... 1 ... ind ... 0.5			2									
9: Nonstandard: _____			9									
! 1 not to be combined with measuring type order no. 2												
! 2 not to be combined with measuring type order no. 1												
! 9 Nonstandard, measuring range within												
1 ... ind ... 0 ... cap ... 1 ... ind ... 0 ... cap ... 1												
or -180 ... 0 ... 180° el												
clear output value, only to 175 ... 0 ... 175° el;												
measuring range $> = 20^\circ$ el												

Order Lists

Continuation from page 278

EMBSIN 271 G - Measuring transducer for phase angle

EMBSIN 281 G - Measuring transducer for power factor

Features	Order no.				
8. output signal					
0 ... 20 mA		1			
4 ... 20 mA		2			
9: _____ mA		9			
0 ... 10 V		A			
Z: _____ V		Z			
! 9: Nonstandard [mA]: 0 ... 1.0 to 0 ... < 20					
-1.0 ... 0 ... 1.0 to -20 ... 0 ... 20					
1 ... 5 to < (4 ... 20)					
! Z: Nonstandard [V]: 0 ... 1.0 to 0 ... < 10					
0.2 ... 1 to 2 ... 10					
-1.0 ... 0 ... 1.0 to -10 ... 0 ... 10					
9. auxiliary voltage					
U _H : 85 ... 230 V AC/DC		1			
U _H : 24 ... 60 V AC/DC		2			
from measuring input (>= 24 ... 60 V AC)		3			
from measuring input (>= 85...230 V AC)		4			
U _H : 24 V AC / 24 ... 60 V DC from		5			
low voltage side					
U _H = rated voltage					
tolerances: DC -15 ... +33 %, AC -15 ... +15 %					
! 3 not to be combined with input rated voltage, order-no. 1 and 2					
10. response time					
4 periods of the input frequency			1		
2 periods of the input frequency			2		
8 periods of the input frequency			3		
16 periods of the input frequency			4		
! 4 periods = standard					
11. test certificates					
without test certificate				0	
with test certificate in German				D	
with test certificate in English				E	

Order Lists

EMBSIN 271 GD – Measuring transducer for phase angle difference

Features	order no.								
EMBSIN 271 GD, measuring transducer for phase angle-difference order no.: 271 GD - Mxxxxxxx	271 GD -	M	X	X	X	X	X	X	X
1. construction housing MBS, for 35mm DIN rail		M							
2. input rated frequency									
50 Hz			1						
60 Hz			2						
9: _____ Hz			9						
! 9: Nonstandard [Hz]: ≥ 10 to 1500									
by auxiliary voltage from measuring input									
40 Hz $\leq f_n \leq 400$ Hz									
3. input rated voltage									
generator and bus bar									
Un : 100 V				1					
Un : 230V				2					
Un : _____ V				9					
3-phase system: Input voltage = linked voltage									
! 9: Nonstandard [V]: ≤ 10 to 690									
by auxiliary voltage from measuring input min. 24 V max 230 V									
! -> see selection criteria 6, digit 3 and 4									
4. measuring range									
-120° ... 0° ... +120° el					1				
9: measuring range : _____ ° e					9				
! 9: Nonstandard [°el], measuring range within									
-10 ... 0 ... 10 to -180 ... 0 ... +180									
clear output value, yet only up to -175° ... 0 ... +175° el									
5. output signal									
0 ... 20 mA						1			
4 ... 20 mA						2			
9: _____ mA						9			
0 ... 10V						A			
Z: _____ V						Z			
! 9: Nonstandard [mA]: 0 ... 1.00 to 0 ... < 20									
-1.0 ... 0 ... 1.00 to -20 ... 0 ... 20									
1 ... 5 to < (4 ... 20)									
! Z: Nonstandard [V]: 0 ... 1.0 to 0 ... < 10									
0.2 ... 1 to 2 ... 10									
-1.0 ... 0 ... 1.0 to -10 ... 0 ... 10									
6. auxiliary voltage									
Uh: 85 ... 230 V AC/DC							1		
Uh: 24 ... 60 V AC/DC							2		
from measuring input (≥ 24 ... 60 V AC)							3		
from measuring input (≥ 85 ...230 V AC)							4		
Uh: 24 V AC / 24 ... 60 V DC from							5		
low voltage side									
Uh = rated voltage									
tolerances: DC -15 ... +33 %, AC -15 ... +15 %									
! 3 and 4 not to be combined with input rated voltage order no. 2									
7. response time									
4 periods of the input frequency								1	
2 periods of the input frequency								2	
8 periods of the input frequency								3	
16 periods of the input frequency								4	
! 4 periods = standard									
8. test certificates									
without test certificate									0
with test certificate German									D
with test certificate English									E

Order Lists

EMBSIN 351 P – Measuring transducer for active power EMBSIN 361 Q – Measuring transducer for re-active power

Features	order no.											
EMBSIN 351 P - Measuring transducer for active power order no.: 351 P - Mx xxxxxxxx	351 P-	M	X	X	X	X	X		X	X	X	X
EMBSIN 361 Q - Measuring transducer for re-active power order no. : 361 Q - M xxxxxxxx	361 Q-	M		X	X	X		X	X	X	X	X
1. construction housing MBS, for 35 mm DIN rail		M										
2. Application 3-/4-wire AC current, balanced (U:L1,L2,L3 I:L1)			1									
3-wire AC current, unbalanced			2									
4-phase AC current, unbalanced			3									
3. rated input frequency 50 Hz			1									
60 Hz			2									
4. input rated voltage U _n : 100 ... 115 V ; _____ V values to be stated!			1									
U _n : 200 ... 230 V ; _____ V			2									
U _n : 380 ... 440 V ; _____ V			3									
U _n : 600 ... 690 V ; _____ V			4									
Nonstandard U _n ; _____ V			9									
! 1 ... 4: True effective nominal voltages to be stated												
! 9: Nonstandard [V]: > 115 to < 600												
U _n = linked voltage!												
5. input current In: 1 A			1									
In: 5 A			2									
6. measuring range bipolar: _____ W			1									
unipolar: _____ W			2									
measuring range end values to be stated in Watt i.e. 500W by measuring range bipolar -500 ... 500												
1000 W by measuring range unipolar 0 ... 1000												
permissible end value : 0.75 ... 1.3 x U _n x I _n x $\sqrt{3}$ [W]												
bipolar: _____ var			1									
unipolar: _____ var			2									
measuring range end values to be stated in var i.e. 500var by measuring range bipolar -500 ... 500												
1000 Var by measuring range unipolar 0 ... 1000												
permissible end value: 0.5 ... 1.0 x U _n x I _n x $\sqrt{3}$ [Var]												
7. output signal, start value bipolar, start value -100 % end value									1			
unipolar, start value 0									2			
live-zero, start value = 20 % end value									3			
! 1 output bipolar not possible with measuring range unipolar measuring range-order no. 2)												
8. output signal, end value end value: 20 mA									1			
end value: 10 mA									2			
end value: 5 mA									3			
end value: 2.5 mA									4			
end value: 10 V									A			
9. auxiliary voltage supply U _h : 85 ... 230 V DC/AC										1		
U _h : 24 ... 60 V DC/AC										2		
from measuring input (>= 85...230 V AC)										4		
U _h : 24 V AC / 24 ... 60 V DC										5		
connection via low voltage side												
tolerances: DC : -15 ... +33 % ; AC: -15 ... +15 %												
! 4 not to be combined with rated input voltage order-no. 3 and 4												
10. test certificates without test certificate											0	
with test certificate German											D	
with test certificate English											E	

Order Lists

EMBSIN 301 – Measuring transducer for alternating current / RMS effective value measuring

auxiliary voltage 230 V AC

Order no.	Measuring range
137112	30 / 15 A
137113	40 / 20 A
137114	50 / 25 A
137115	60 / 30 A
137117	100 / 50 A
137118	150 / 75 A
137119	200 / 100 A
137120	250 / 125 A
137121	300 / 150 A
137122	400 / 200 A
137123	500 / 250 A
137124	600 / 300 A

auxiliary voltage 24 V DC

Order no.	Measuring range
137212	30 / 15 A
137213	40 / 20 A
137214	50 / 25 A
137215	60 / 30 A
137217	100 / 50 A
137218	150 / 75 A
137219	200 / 100 A
137220	250 / 125 A
137221	300 / 150 A
137222	400 / 200 A
137223	500 / 250 A
137224	600 / 300 A

EMBSIN 391 PV – Programmable measuring transducer for all electrical parameters

Features	Order no.										
EMBSIN 391 PV, programmable measuring transducer for all electrical parameters order no.: 391 P - Vxxxxxxxxx	391 P -	V	X	X	X	X	X	X	X	X	X
1. application											
single-phase alternating current			1								
3-wire direct current, balanced			2								
3-wire direct current, unbalanced			3								
4-wire direct current, balanced			4								
4-wire alternating current, unbalanced			5								
2. nominal range of the input voltage											
input voltage direct connection											
input voltage via voltage transformer				A							
0 ... 50 V AC (linked voltage!)											
please state value!					1						
0 ... 500 V AC (linked voltage!)											
please state value!					2						
3. nominal value of the input current											
input current via current transformer						B					
0 ... 0.5 A AC, please state value!							1				
0 ... 5.0 A AC, please state value!							2				
4. auxiliary voltage											
universal power supply (24 ... 300 V DC/ 40 ... 276 V AC)								1	0		
AC-voltage supply (!)											
(!) units with this type of auxiliary voltage supply have only one											
analogue measuring output								2			
AC-voltage supply											
57.74 V AC									1		
63.5 V AC									2		
100 V AC									3		
110 V AC									4		
230 V AC									5		
250 V AC									6		
400 V AC									7		
500 V AC									8		
5. type of serial interface											
RS232										1	
RS485										2	
6. state upon delivery											
transmission parameters are not set											0
parameters are arranged acc. to customer specification											1

Order Lists

ordering schedule 1

EMBSIN 391 PV – Programmable measuring transducer for all electrical parameters

Description		Code
measuring volume		
true-rms-current		
application		
single-phase alternating current	L	I ₁ , I ₂ , I ₃
alternating current, three-phase system	L ₁ , L ₂ or L ₃	I _N or I
measuring range	0 ... 0.5 A to 0 ... 5 A	_____ A
true-rms-voltage		
single-phase alternating current	U	_____
	phase to N	
	U ₁ , U ₂ or U ₃	
alternating current	linked voltage	_____
	U ₁ -U ₂ , U ₂ -U ₃ or U ₃ -U ₁	
measuring range	0 ... 50 V to 0 ... 500 V	0 - _____ V
frequency		
all connections	system frequency	_____ Hz
measuring range	45 Hz ≤ f ≤ 65 Hz (f ₁ ≤ f ≤ f ₂)	__ ≤ f ≤ __ Hz
phase angle		
single-phase alternating current		
alternating current, three-phase system	φ ₁ , φ ₂ , φ ₃ (U - I) φ ₁₂ , φ ₁₃ , φ ₂₃ (U ₁ -U ₂ , U ₁ -U ₃ , U ₂ -U ₃) average value φ	
measuring range	-180° ≤ φ ≤ 180° defined range (φ ₁ ≤ φ ≤ φ ₂)	
power factor		
single-phase alternating current	PF	
alternating current	PF ₁ , PF ₂ or PF ₃ PF total supply network	
measuring range	-1 ≤ PF ≤ +1 defined range	
active power		
single-phase alternating current	P	
alternating current, three-phase system	P ₁ , P ₂ or P ₃ P-total	_____ W _____ W
measuring range	dependent on input value U, I (+/-) ... W	
re-active power		
single-phase alternating current	Q	
alternating current, three-phase system	Q ₁ , Q ₂ or Q ₃ Q-total	_____ var _____ var
measuring range	dependent on input value U, I (+/-) ... var	

Order Lists

ordering schedule 2

EMBSIN 391 PV – Programmable measuring transducer for all electrical parameters

Description	Code	
measuring volume		
apparent power (VA)		
single-phase alternating current	S	_____
alternating current, three-phase system	S ₁ , S ₂ or S ₃ S total	_____
measuring range	dependent on value U, I (+/-) ... VA	___ VA ... __VA
retrievable available values		
current phases I ₁ , I ₂ , I ₃	I ₁ , I ₂ or I ₃	DDI ₁ , DDI ₂ , DDI ₃
mean value of the total apparent power	S total	DDSt
total active power	P-total positive P-total negative	DDPt+ DDPt-
total re-active power	Q-total -L Q-total +C	DDQtL DDQtC
measuring range	dependent on the type of inquiry	_____
type of output characteristic		
type of output characteristic	linear curved (1)	L B
(1) when ordering curved output characteristics please refer to the additional information in table 3		
outputs		
start value of the output signals	-20 mA ≤ I ≤ +20 mA current -10 V ≤ U ≤ +10 V voltage	_____mA _____V
output value	0 ... 20 mA current output 0 ... 10 V voltage output	_____mA _____V
standard output values		0 ... 1 mA 0 ... 5 mA 0 ... 10 mA 0 ... 20 mA 4 ... 20 mA -1 ... 0 ... +1 mA -10 ... 0 ... +10 mA -20 ... 0 ... +20 mA 0 ... 10 V -1 ... 0 ... +1 V -10 ... 0 ... +10 V

All output signals are limited to 120 % of the rated nominal value

ordering schedule 3

EMBSIN 391 PV - Programmable measuring transducer for all electrical parameters

Table 3

Additional information when ordering measuring transducers with curved output characteristics

When ordering measuring transducers with curved characteristics the start and end points as well as the position of the required curved break of the to be adjusted transmission ratio have to be defined. Measuring transducers of the type **EMBSIN 391 PV** allow the presentation of transmission characteristics of up to 5 curved breaks .

Description	Code	
start value of the measuring value (s)	dependent on measuring range s	
start value of the output value	-20 mA ... +20 mA/ -10 V ... +10 V dependent on output range -20 ≤ p ≤ +20/ -10 ≤ p ≤ +10	p
end value of the measuring value (e)	dependent on measuring range	e
end value of the output value (rt) if measuring value (e)	-20 mA ... +20 mA/ -10 V ... +10 V dependent on output range	rt
value of the measuring value (n _x)	dependent on measuring range	n ₁ ... n ₅
value of the output value (o _x) if measuring value (n _x)	-20 mA ... +20 mA/ -10 V ... +10 V dependent on output range -20 ≤ p ≤ +20/ -10 ≤ p ≤ +10	o ₁ ... o ₅

Ordering example:

The measuring transducer EMBSIN 391 PV is installed into a 4-wire alternating current supply network with balanced phase-loads. The measuring transducer is connected via a voltage transformer 100/0.11 kV as well as to a current transformer of 200/5 A. The auxiliary voltage supply of the measuring transducer is effected by means of an integrated power unit. For the communication an interface of RS485 is required. The following measuring values must be included in the measuring feeds:

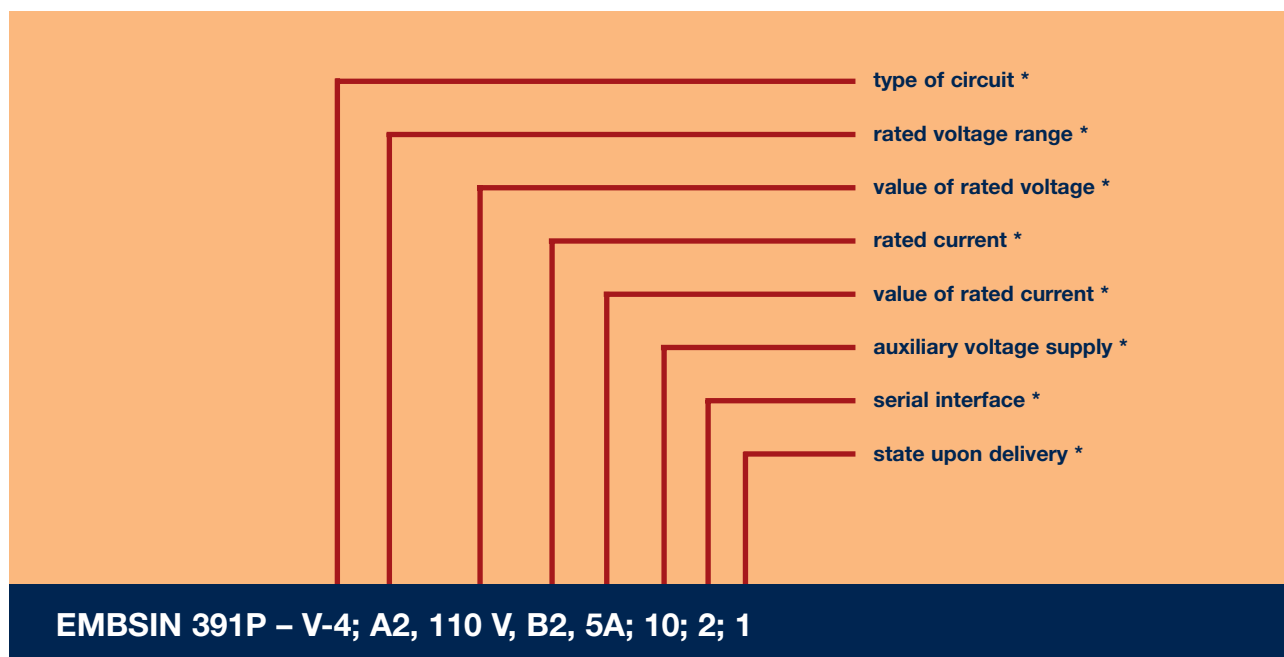
Output 1	
total output of the system	-40 ... +40 MW
output current	-20...+20 mA
transmission ratio	linear
Output 2	
measuring value	phase angle
output voltage	0 ... 10 V
	start value: $-180^\circ = -10\text{ V}$
	curved point: $0^\circ = 10\text{ V}$
	end value: $179.9^\circ = 10\text{ V}$
Output 3	
measuring value	system frequency 45 ... 55 Hz
current output	0 ... 20 mA
	48 Hz = 2 mA
	52 Hz = 18 mA
	55 Hz = 20 mA

Ordering text: EMBSIN 391 P - V-4; A2, 110 V; B2, 5 A; 10; 2, 1

output 1: $P \pm 40\text{ MW}$; L; -20...200 mA

output 2: $\varphi \pm 180^\circ$; B; (180/-10; 0/0; 180/10)

output 3: f 45...55 Hz; B; (45/0, 48/2, 52/18, 55/20)



* order code of table 1, page 282