



Technical data

Material properties of products	316
International short forms of types of conductors	317
preparation of aluminum conductors	317
Term definitions	317
Degrees of protection	318 - 319
Formation of condensed water and retaliatory actions	320
Cable entries	321
Outside diameter of conventional cable cross-sections	322
Short forms of cables	322
Assignment of cable outside diameters to cable entry glands	323
Terminal technology	324
Rated diversity factor for built-in devices according to IEC 60 439-1	325
Rating of insulated conductors in switchgear assemblies	325
Rating of the N and PE conductor per circuit	325
Routine test protocol (Copy template) in accordance with IEC 60 439-1	326
Declarations of EC Conformity	327 - 333
Products and RoHS Conformity	334





Service	DK	KV	ENYSTAR	Mi	MC	LES	HENPAS	Technical data	Chemical resistance ¹⁾										
									Acid 10 %	Lye 10 %	Alcohol	Petrol (MAK) ²⁾	Benzene (MAK) ²⁾	Mineral oil					
									Glow wire test IEC 60 695-2-11	UL Subject 94	Temperature resistance								
									used with product	material									
									K 7... / K 12.. / K 24.. Lid of Mi distribution boards and door and lid of KV Small-type distribution boards / ENYSTAR doors / hinged lid with KG	PC (polycarbonate)	960° C	V-2	-40° C / +120° C	+	+	0	+	-	+
									KF ... / KX ... Bottom parts of Mi and ENYSTAR distribution boards	PC-GFS (polycarbonate)	960° C	V-0	-40° C / +120° C	+	+	0	+	-	+
									KD ...	PC (polycarbonate) PC-5 impact resistant	960° C	5V	-40° C / +120° C	+	+	0	+	-	+
									RX ... / LX ...	PC-G1 (polycarbonate) impact resistant surface-coated	960° C	V-0	-40° C / +120° C	+	+	0	+	-	+
									D ... / DP ... / DPC ... DE ... / K ... / KC ... RD ... / RK ... KV ... / KG ...	PS (polystyrene)	750° C	V-2	-40° C / +70° C	+	+	+	-	-	0
									K ... / KV ... / Mi ... / ENYSTAR	PUR (polyurethane)	—	—	-25° C / +80° C	0	+	0	0	-	+
									D ... / DP ... / DPC ... DE ... / K ... / KC ... KF ... / RD ... / RK ... KV ... / Mi FP 38 / FP FG ... ESM .. / STM .. / EDK .. EDR .. / KST .. / DPS .. ERA .. / EKA .. / EVS ..	TPE (thermoplastic elastomer)	750° C	—	-25° C / +100° C	+	+	+	0	0	0
									ASM .. / AKM ..	PA (polyamide)	960° C	V-0	-40° C / +100° C	+	0	+	+	+	+
									ASS .. / AXM ..	PA (polyamide)	960° C	V-2	-40° C / +100° C	+	0	+	+	+	+
									AKM .. / AVS ..	PA (polyamide)	750° C	V-2	-40° C / +100° C	+	0	+	+	+	+
									AKM .. / ASM .. / ASS .. AKS .. / AXM ..	CR/NBR (polychloroprene - nitrile rubber)	—	—	-20° C / +100° C	+	+	+	0	-	0
									ASS .. / AXM ..	TPE (Evoprene)	—	—	-20° C / +100° C	+	-	+	-	-	-
									ASS .. / AXM ..	CR (chloroprene rubber)	—	—	-30° C / +100° C	+	+	+	0	-	0
									Ste ..	PVC (polyvinyl chloride)	650° C	—	-20° C / +70° C	0	0	-	-	-	-

(+ = resistance; 0 = partially resistance; — = not resistant)

1) The specifications on chemical resistance are a general guide. In individual cases it may be necessary to check resistance in combination with other chemicals and ambient conditions (temperature, concentration, etc.)

2) (MAK) - Maximum allowable concentration (work place)

International short forms of types of conductors:

r (rigid)	sol (solid)		
	(conductors with circular cross section and sector type of conductors)		
s (stranded)			
	(conductors with circular cross section and sector type of conductors)		
f (flexible)			

Reference to the preparation of aluminum conductors:

1. Clean the bared conductor end carefully by scraping off the oxide film, for example with a knife, (Please do not use rasps, emery paper or brushes!).
2. Immediately after removing the oxide film the conductor end is to rub in with acid and alkali free fat for example vaseline, and immediately to be connected in the terminal.
3. The prementioned processing steps are to be repeated, if the conductor was disconnected and connected again.
4. Due to the disposition to flowing of aluminum the terminals are to be re-tightened before start-up and after the first 200 operation hours.

Term definitions

Rated values for setting up low-voltage switchgear are given in the standard IEC 60 439-1.

I_{cw} Rated short-time withstand current

The rated short-time current of a circuit of an assembly is the r.m.s. value of short-time current assigned to that circuit by the manufacturer which that circuit can carry without damage under the test conditions specified in 8.2.3 IEC 60 439-1. Unless otherwise stated by the manufacturer, the time is 1 s.

I_e Rated operational current

A rated operational current of an equipment is stated by the manufacturer and takes into account the rated operational voltage, the rated frequency, the rated duty, the utilization category and the type of protective enclosure, if appropriate.

I_n Rated current

The rated current of a circuit of an ASSEMBLY is stated by the manufacturer, taking into consideration the ratings of the components of the electrical equipment within the ASSEMBLY, their disposition and application. This current must be carried without the temperature-rise of the various parts of the ASSEMBLY exceeding the limits specified in 7.3. (tabel 2) when verified according to 8.2.1. IEC 60 439-1.

I_{PK} Rated peak withstand current

The rated peak withstand current of a circuit of an assembly is the value of peak current assigned to that circuit by the manufacturer which that circuit can withstand satisfactorily under the test conditions specified in 8.2.3. IEC 60 439-1.

U_e Rated operational voltage

The rated operational voltage of a circuit of an assembly is the value of voltage which, combined with the rated current of this circuit, determines its application. For polyphase circuits, it is stated as the voltage between phases.

U_i Rated insulation voltage

The rated insultaion voltage of a circuit of an assembly is the voltage value to which dielectric test voltages and creepage distances are referred. The maximum rated operational voltage of any circuit of the assembly shall not exceed its rated insulation voltage. It is assumed that the rated operational voltage of any circuit of an assembly will not, even temporarily, exceed 110 % of its rated insulation voltage.

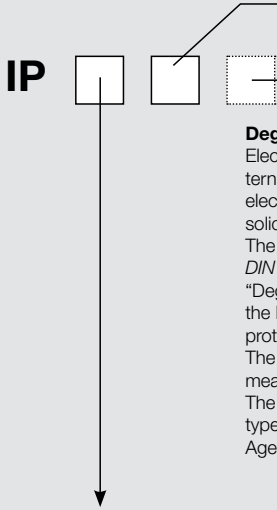
TSK Type-tested low-voltage switchgear and controlgear assembly

a low-voltage switchgear and controlgear assembly conforming to an established type or system without deviations likely to significantly influence the performance, from the typical assembly verified to be in accordance with this standard.

PTSK Partially type-tested low-voltage switchgear and controlgear assembly

a low-voltage switchgear and controlgear assembly, containing both type-tested and non-type-tested arrangements, provided that the latter are derived (e.g. by calculation) from type-tested arrangements which have complied with the relevant tests (see table 7) IEC 60 439-1.

Degrees of protection according to IEC 60 529



Degree of protection of electrical equipment

Electrical equipment must be protected for safety reasons from external influences and conditions. Enclosures provide the protection of electrical equipment against access to hazardous parts and against solid foreign objects, as well as dust, humidity and water. The international standard IEC 60 529, the German standard *DIN EN 60 529 / VDE 0470 Part 1 September 2000* with the title "Degrees of protection provided by enclosures (IP Code)", form the basis for the determination and designation of the degree of protection. The degree of protection provided by an enclosure is proven by means of standardized testing methods. The becoming "aged" of test samples before carrying out the actual type tests are part of the standardized testing methods. Ageing is made by a more-active increased thermal treatment.

The marking system consists of the code letters **IP** and two following characteristic numerals.

Example:
IP 6 7

Code letters
(International Protection)

1st characteristic numeral: Protection against foreign solid objects and direct contact				Additional letter	
Meaning for the protection of equipment against ingress of solid foreign objects and of persons against access to hazardous parts with (non-protected) back of hand, finger, tool or wire.				Additional letter where the actual protection against access to hazardous parts is higher than that indicated by the 1st characteristic numeral (e.G. IP 20C)	
	Protection against ingress of solid foreign objects ...	Protection against access to hazardous parts with ...	Definition	Short form: Protection against access with ...	Definition
IP 0X	non-protected	non-protected			
IP 1X	solid foreign objects $\geq 50 \text{ mm } \varnothing$	the back of a hand	The access probe, sphere of 50 mm \varnothing , shall have adequate clearance from hazardous parts. The object probe, sphere of 50 mm \varnothing , shall not fully penetrate.	A	the back of the hand The access probe, sphere of 50 mm \varnothing , shall have adequate clearance from hazardous parts.
IP 2X	solid foreign objects $\geq 12.5 \text{ mm } \varnothing$	a finger	The jointed test finger, 12 mm \varnothing , 80 mm length, shall have adequate clearance from hazardous parts. The object probe, sphere of 12.5 mm \varnothing shall not fully penetrate.	B	a finger The jointed test finger of 12 mm \varnothing , 80 mm length, shall have adequate clearance from hazardous parts.
IP 3X	solid foreign objects $\geq 2.5 \text{ mm } \varnothing$	a tool $\geq 2.5 \text{ mm } \varnothing$	The object probe / access probe of 2.5 mm \varnothing shall not penetrate at all.	C	a tool $\geq 2.5 \text{ mm } \varnothing$ The access probe of 2.5 mm \varnothing , 100 mm length, shall have adequate clearance from hazardous parts.
IP 4X	solid foreign objects $\geq 1.0 \text{ mm } \varnothing$	a wire $\geq 1 \text{ mm } \varnothing$	The object probe / access probe of 1.0 mm \varnothing shall not penetrate at all.	D	a wire $\geq 1 \text{ mm } \varnothing$ The access probe of 1.0 mm \varnothing , 100 mm length, shall have adequate clearance from hazardous parts.
IP 5X	dust-protected	with any auxiliary equipment (wire)	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety. The access probe of 1.0 mm \varnothing , shall not penetrate.		
IP 6X	dust-tight	contact with any auxiliary equipment (wire)	No ingress of dust. The access probe of 1.0 mm \varnothing shall not penetrate at all.		

Meaning of the first characteristic numeral

The first characteristic numeral indicates, to what extent the enclosure provides protection for persons against the access to (affecting of) hazardous parts. This protection is reached, when the penetration into an enclosure of a part of the body or a foreign object, which is held by a person, is prevented or limited. At the same time the enclosure provides protection of equipment against the penetration of solid foreign objects. This is the reason for having two descriptions and two definitions to each first characteristic numeral.

Meaning of the second characteristic numeral

The second characteristic numeral indicates the protection of the enclosure against ingress of water with harmful effects on the electrical equipment.

Additional letters to the IP Code

The IP Code can be still extended by additional letters. Additional letters indicate the degree of protection against access to hazardous parts. Additional letters follow the two characteristic numerals. Additional letters are only used, - if the actual protection against access to hazardous parts is higher than by the first characteristic numeral indicated; or - if only the protection against access to hazardous parts is indicated and the degree of protection against solid foreign objects is not considered. The first characteristic numeral being then replaced by an X. An enclosure shall only be designated with a stated degree of protection indicated by the additional letter if the enclosure also complies with all lower degrees of protection.

2nd characteristic numeral: Protection against ingress of water with harmful effects

	IP X0	IP X1	IP X2	IP X3	IP X4	IP X5	IP X6	IP X7	
Brief description	non-protected	Protected from vertically falling water drops	Protected against vertically falling water drops when enclosure is tilted up to 15°	Protected against spraying water	Protected against splashing water	Protected against water jets	Protected against powerful water jets	Protected against the effects of temporary immersion in water	
Definition		Vertically falling drops shall have no harmful effects	Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical	Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects	Water splashes against the enclosure from any direction shall have no harmful effects	Water projected in jets against the enclosure from any direction shall have no harmful effects	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time	
Short form		vertically dripping water	dripping water (15° tilted)	spraying water	splashing water	jetting water	powerful jetting water	temporary immersion	Short form
Symbol		☐	☐	☐	☐	☐	☐	☐	Symbol
	IP 20								
	IP 30	IP 31							
	IP 40	IP 41	IP 42	IP 43	IP 44				
					IP 54	IP 55			
						IP 65	IP 66	IP 67	

Classification of the impact strength by the IK Code

The European standard for enclosures EN 50298:98 includes also the IK Code for impact strength. With the DIN EN 50102 (VDE 0470 part of 100) "Degrees of protection by enclosures for electrical operational funds (equipment) against outside mechanical loads (IK Code)", is defined with the identification letters IK. This standard regulates the methods for the description of the protection of enclosures against outside mechanical loads. This indicates the degree of protection, which is provided by an enclosure against a mechanical load (demand energy in joules). HENSEL tests its enclosures and enclosure systems additionally also according to this standard.

IK Code: Demand energy value [W] in joules.

IK Code	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
[W] in J	0.14	0.2	0.35	0.5	0.7	1	2	5	10	20

Formation of condensed water in electrical installations

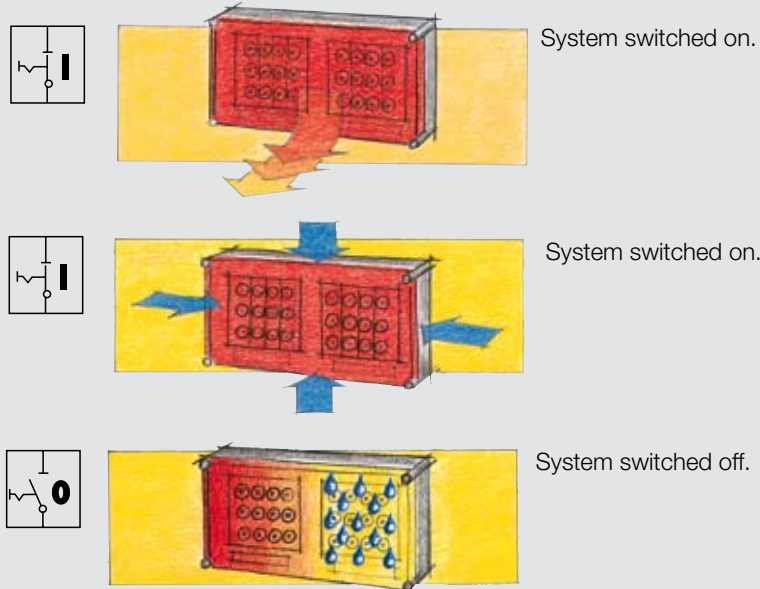
How does condensed water occur in enclosures with a high degree of protection?

The internal temperature is higher than the external temperature due to the power dissipation of the built-in devices.

The warm air inside the enclosure attempts to accumulate moisture. This comes from outside through the seal as the enclosures are not gas-tight.

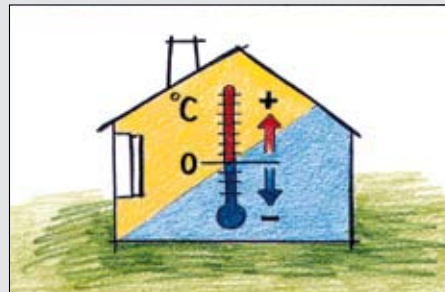
The internal temperature is reduced by cooling down the system e.g. by switching off the loads. The cooler air emits moisture which is collected as condensed water on the cooling inner surfaces.

The problem of condensed water forming in electrical installations only occurs in enclosures with a degree of protection \geq IP 54 since the temperature adjustment that is carried out from inside to outside is too low due to the high density of the enclosure and its material.



In which areas does condensed water occur?

Formation of condensed water for indoor installations:



In areas where high levels of air humidity and large temperature fluctuations are expected e.g. in laundry rooms, kitchens, car washes etc.

Formation of condensed water in protected outdoor installations (protected against weather influences) or unprotected outdoor installations:



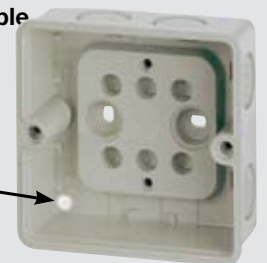
Here condensed water can be formed dependent on the weather, high air humidity, direct sunlight and temperature differences compared to the wall

Example:

DK Cable junction boxes

Measure against accumulation of condensed water in cable junction boxes:

1. Select the installation site (avoid temperature differences).
2. Open condensed water membrane (●) at the lowest point of the cable junction box (maybe drill hole \varnothing 5 mm).
3. Enable exchange of air via ventilation.



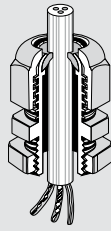
Example:

Ventilation flange

for ventilation of Mi distribution boards in case of extremely high inside temperature or the risk of **water condensation**, for vertical mounting on the lateral box walls, degree of protection IP 23.

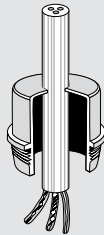


Cable entries:



Cable glands ASM/AKM/ASS

with strain relief and counter nut, degree of protection IP 65.

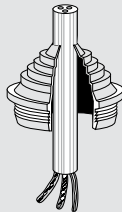


Grommets ESM

Degree of protection IP 55

Grommets ESM are inserted into knock outs.

No nut is necessary!

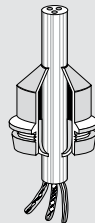


Stepped grommets STM

Degree of protection IP 55

Stepped glands STM are inserted into knock outs.

No nut is necessary!

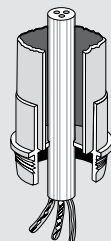


Grommets EDK

Degree of protection IP 65

Grommets EDK are inserted into knock outs.

No nut is necessary!

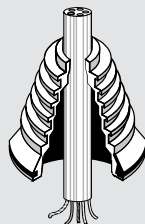


Grommets for conduits EDR

Degree of protection IP 65

Grommets for conduits EDR are inserted into knock outs.

No nut is necessary!

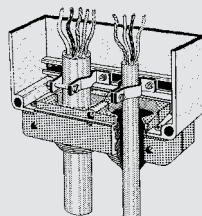


Stepped grommet KST 70

Degree of protection IP 65

Stepped grommets KST 70 are inserted into knockouts.

No nut is necessary!



Cable insertion unit

After detaching the upper box fin the cable insertion unit can be fixed to any 300 mm box wall.

The cable is to be inserted in the box from the front.

Degree of protection IP 54 with additional strain and cable retention

(e.g. Mi ZE 62). The assembly instructions must be observed!

Outside diameter of conventional cable cross-sections

The outside diameters are average values of different products.

Kabel-querschnitt	NYM	NYY	NYCY NYCWY	Kabel-querschnitt	NYM	NYY	NYCY NYCWY
mm ²	mm Ø	mm Ø	mm Ø	mm ²	mm Ø	mm Ø	mm Ø
1x4	8	9	—	4x1,5	11	13,5	14
1x6	8,5	10	—	4x2,5	12,5	14,5	15
1x10	9,5	10,5	—	4x4	14,5	17,5	17
1x16	11	12	—	4x6	16,5	18	18
1x25	—	14	—	4x10	18,5	20	20
1x35	—	15	—	4x16	23,5	23	23
1x50	—	16,5	—	4x25	28,5	28	28
1x70	—	18	—	4x35	32	26-30	29
1x95	—	20	—	4x50	—	30-35	34
1x120	—	21	—	4x70	—	34-40	37
1x150	—	23	—	4x95	—	38-45	42
1x185	—	25	—	4x120	—	42-50	47
1x240	—	28	—	4x150	—	46-53	52
1x300	—	30	—	4x185	—	53-60	60
2x1,5	10	12	—	4x240	—	59-71	70
2x2,5	11	13	—	4x25/16	—	—	30
2x4	—	15	—	4x35/16	—	—	30
2x6	—	16	—	4x50/25	—	—	34-37
2x10	—	18	—	4x70/35	—	—	40
2x16	—	20	—	4x95/50	—	—	44,5
2x25	—	—	—	4x120/70	—	—	48,5
2x35	—	—	—	4x150/70	—	—	53
3x1,5	10,5	12,5	13	4x185/95	—	—	—
3x2,5	11	13	14	4x240/120	—	—	—
3x4	13	16	16	5x1,5	12	15	15
3x6	15	17	17	5x2,5	13,5	16	17
3x10	18	19	18	5x4	15,5	16,5	18
3x16	20	21	21	5x6	18	19	20
3x25	—	26	—	5x10	20	21	—
3x35	—	—	—	5x16	26	24	—
3x50	—	—	—	5x25	31,5	—	—
3x70	—	—	—	7x1,5	13	16	—
3x95	—	—	—	7x2,5	14,5	16,5	—
3x120	—	—	—	19x1,5	—	22	—
3x150	—	—	—	24x1,5	—	25	—
3x185	—	—	—				
3x240	—	—	—				
3x25/16	—	27	27				
3x35/16	—	28	27				
3x50/25	—	32	32				
3x70/35	—	32-36	36				
3x95/50	—	37-41	40				
3x120/70	—	42	43				
3x150/70	—	46	47				
3x185/95	—	52	48-54				
3x240/120	—	57-63	60				
3x300/150	—	63-69	—				

Short forms of cables

- NYM Light plastic-sheathed cable
- NYY Plastic-sheathed cable
- NYCY Plastic-sheathed cable with concentric conductor
- NYCWY Plastic-sheathed cable with concentric, undulated conductor

Assignment of cable outside diameters to cable entry glands

cable entry metric	outside diameters of cables	
	min. mm Ø	max. mm Ø
ASM/AKM/ASS 12	3	6.5
ASM/AKM/ASS 16	5	10
ASM/AKM/ASS 20	6.5	13.5
ASM/AKM/ASS 25	10	17
ASM/AKM/ASS 32	14	21
ASM/AKM/ASS 40	20	28
ASM/AKM/ASS 50	25	35
ASM/AKM/ASS 63	35	48
<hr/>		
AXM 20	5.5	13
AXM 25	8	17
AXM 32	12	21
AXM 40	17	28
AXM 50	22	35
<hr/>		
ESM 16	4.8	11
ESM 20	6	13
ESM 25	9	17
ESM 32	9	23
ESM 40	17	30
<hr/>		
STM 16	3.5	12
STM 20	5	16
STM 25	5	21
STM 32	13	26.5
STM 40	13	34
<hr/>		
EDK 16	5	10
EDK 20	6	13
EDK 25	9	17
EDK 32	8	23
EDK 40	11	30
<hr/>		
	conduit	
EDR 16	M 16	
EDR 20	M 20	
EDR 25	M 25	
EDR 32	M 32	
EDR 40	M 40	

Hensel cable entries comply with the following standards and regulations

- EN 50 262
Metric cable entries for electrical installations
- EN 60 423
Conduits for electrical purposes - Outside diameter of conduits for electrical installations and threads for conduits and fittings
- IEC 60 529
Degrees of protection provided by enclosures (IP-Code)

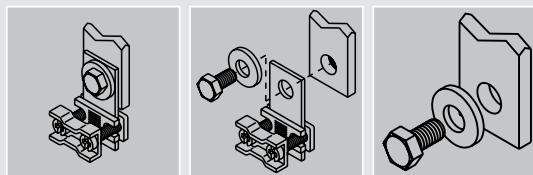
Terminals for incoming cables

2-5-pole,
for Cu- and aluminium¹⁾ wires,
to be assembled in Mi empty boxes
sizes 2 to 8,
complete on mounting plates 300 x 300 mm,
with fastening screws.


Terminals for incoming cables

	Mi VE 120 4-pole	Mi VE 125 5-pole	Mi VE 240 4-pole	Mi VE 245 5-pole	Mi VE 302 2-pole	Mi VE 303 3-pole	Mi VE 304 4-pole
Rated connecting capacity	150 mm ²		240 mm ²		300 mm ²		
Current carrying capacity	250 A		400 A		630 A		
Tightening torque	20 Nm		40 Nm		50 Nm		
Clamping units per pole	2	4	2	4	2	4	
sol (round) ●	16-50	16-50	25-50	25-50	-	70	
s (round), f (flexible) ●●●●	16-150	16-70	25-240	25-120	120-300	70-185	
sol (sector) ▲	50-150	50-70	50-185	50-120	120-185	95-185	
s (sector) ▲▲▲	35-150	35-70	35-240	35-120	120-300	95-185	
Outgoing wiring strip (C)	Mi VS 100 bis Mi VS 630	Mi VS 100 bis Mi VS 630	Mi VS 100 bis Mi VS 630	Mi VS 100 bis Mi VS 630	Mi VS 630		Mi VS 630

1) Prior to connection, aluminium conductors must be prepared according to the relevant technical recommendations. The connections must be checked at regular intervals and maintained after 6 months at the latest.

General terminal technology


Saddle clamping
unit for copper
conductors
up to 70 mm²

after removal
of the saddle
clamp connec-
tion via cable lug
M8

connection
with screw
M 10/M 12



Rated diversity factor for built-in devices according to IEC 60 439-1

The following reduction factors may be applied where more than one circuit is installed in one box or installation assembly and if no details of the rated current are known:

Number of circuits	Factor
2-3	0,9
4-5	0,8
6-9	0,7
10 and more	0,6

Rating of insulated conductors in switchgear assemblies

The selection of cross-section for the conductors within switchgear assemblies is subject to the responsibility of the manufacturer in accordance with IEC 60 439-1.

We recommend the following cross-sections dependent on the series-connected protective devices.

The values of Table 1 are based on the phase conductors.

Wiring information for devices (e.g. conductor size min. ... mm²) must be noted as a matter of priority.

Table 1:

Protective device	PVC H07V-K max. 70° C	NSGAFöu max. 90° C	Wiring strip max. 105° C
20 A	2,5 mm ²	2,5 mm ²	
25 A	4 mm ²	4 mm ²	
32/35 A	6 mm ²	6 mm ²	
40/50 A	10 mm ²	10 mm ²	
63 A	16 mm ²	16 mm ²	
80 A	25 mm ²	25 mm ²	
100 A	35 mm ²	25 mm ²	Mi VS 100
125 A	50 mm ²	35 mm ²	Mi VS 160
160 A	70 mm ²	70 mm ²	Mi VS 160
200 A	95 mm ²	95 mm ²	Mi VS 250
250 A	120 mm ²	120 mm ²	Mi VS 250
315 A		150 mm ²	Mi VS 400
400 A			Mi VS 400
630 A			Mi VS 630

Rating of the PE and N conductor per circuit

Phase conductor $\leq 16 \text{ mm}^2$ as phase conductor

Phase conductor $> 16 \text{ mm}^2$ 1/2 phase conductor cross-section, at least however 16 mm² (not EMC-compliant)

In buildings with a high proportion of a.c. loads or sources of harmonic voltages (electronic ballasts or PCs), it can be necessary to implement the N conductor with the same current carrying capacity as the phase conductors.

For all Hensel busbar systems up to 630 A, the N conductor must be implemented with the same current carrying capacity.

Testreport

Customer: _____

Customer: _____

Address: _____

Address: _____

Project: _____

Project: _____

**Routine test protocol
in accordance with EN 60 439-1**

**Routine test protocol
in accordance with EN 60 439-1**

		tested
1.	Inspection of the switchgear assembly	
1.1	Reliability of operating elements	
1.2	Wiring (pressure points, edges)	
1.3	Built-in devices (Installation, positioning, fit)	
1.4	Degree of protection (sealings, protection covers)	
1.5	Creepage distances and clearances	
1.6	Screwed connections, terminals (interference fit, contacts)	
1.7	Circuit identification (marking)	
1.8	Electrical functional test	
2.	Insulation test	
2.1	Verification of insulation resistance	
3.	Protective measures	
3.1	PE conductor connections	
3.2	Screwed connections	
Test engineer:		
Location:		
Date:		
Stamp:		

		tested
1.	Inspection of the switchgear assembly	
1.1	Reliability of operating elements	
1.2	Wiring (pressure points, edges)	
1.3	Built-in devices (Installation, positioning, fit)	
1.4	Degree of protection (sealings, protection covers)	
1.5	Creepage distances and clearances	
1.6	Screwed connections, terminals (interference fit, contacts)	
1.7	Circuit identification (marking)	
1.8	Electrical functional test	
2.	Insulation test	
2.1	Verification of insulation resistance	
3.	Protective measures	
3.1	PE conductor connections	
3.2	Screwed connections	
Test engineer:		
Location:		
Date:		
Stamp:		



Technical data
Declaration of EC Conformity
DK Cable junction boxes

Erklärung
der EG-Konformität

Nr. K 6009

Declaration of EC-Conformity

Das Produkt,
The product

Typbezeichnung: **D ..., DE ..., DM ..., DN ..., DP ..., DPC ..., K ..., KC ..., KD ..., KF ..., KM ...**
Type Reference:

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Kabelabzweiggästen**
Description: **cablE junction boxes**

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **IEC 60 998**
Standard, Document:

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Niederspannungs-Richtlinie 2006/95/EG
Low voltage directive 2006/95/EC

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
CE-Kennzeichnung: **2006**
Year of affixing CE-Marking:

Ausstellungsdatum: **10.04.2007**
Date of issue:

Gustav Hensel GmbH & Co. KG

ppa.
R. Cater 
- Technische Leitung -
- *Technical Director* -

Service

DK

KV

ENYSTAR

Mi

MC

LES

HENPAS

Technical data



Technical data
Declaration of EC Conformity
KX Cable junction boxes for hazardous areas

Erklärung

der EG-Konformität

Nr. KX 2005

Declaration of EC-Conformity

Das Produkt,
The product

Typbezeichnung: **KX 2025, KX 2045, KX 2065,**
Type Reference: **KX 2105, KX 2255**

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Kabelabzweigkästen für explosionsgefährdete Bereiche**
Description: **Cable junction boxes for explosive atmospheres**

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **EN 50 281-1-1: 10/1999**
Standard, Document: **EN 50 021: 02/2000**

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung
in explosionsgefährdeten Bereichen
Equipment and protective systems intended for use in potentially explosive atmospheres
94/9/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
CE-Kennzeichnung: **2005**
Year of affixing CE-Marking:

Ausstellungsdatum: **01.03.2005**
Date of issue:

Gustav Hensel GmbH & Co. KG

ppa.
R. Cater

- Technische Leitung -
- *Technical Director* -



Technical data
Declaration of EC Conformity
RX Terminal boxes for hazardous areas

Erklärung
der EG-Konformität

Nr. KX 2006

Declaration of EC-Conformity

Das Produkt,
The product

Typbezeichnung: **RX 120203, RX 120205, RX 120207, RX 040405, RX 040410**
Type Reference: **RX 060414, RX 100605, RX 101005, RX 251605, RX 353505**

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Kabelabzweigkästen mit Reihenklemmen**
für explosionsgefährdete Bereiche
Description: **Cable junction boxes with terminal blocks**
for explosive atmospheres

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **EN 50 281-1-1: 10/1999**
Standard, Document: **EN 50 021: 02/2000**

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung
in explosionsgefährdeten Bereichen
Equipment and protective systems intended for use in potentially explosive atmospheres
94/9/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
 CE-Kennzeichnung: **2006**
Year of affixing CE-Marking:

Ausstellungsdatum: **01.03.2006**
Date of issue:

Gustav Hensel GmbH & Co. KG

ppa.
 R. Cater
 - Technische Leitung -
 - *Technical Director* -

Service
 DK
 KV
 ENYSTAR
 Mi
 MC
 LES
 HENPAS
 Technical data



Technical data
Declaration of EC Conformity
Empty box as "Component" for hazardous areas

Erklärung

der EG-Konformität

Declaration of EC-Conformity

Nr. KX 2007

Das Produkt,
The product

Typbezeichnung: **LX 1200, LX 0400, LX 0600, LX 1000,**
Type Reference: **LX 2500, LX 3500**

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Leergehäuse**
für explosionsgefährdete Bereiche
Description: **Empty boxes**
for explosive atmospheres

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **EN 50 281-1-1: 10/1999**
Standard, Document: **EN 50 021: 02/2000**

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung
in explosionsgefährdeten Bereichen
Equipment and protective systems intended for use in potentially explosive atmospheres
94/9/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Ausstellungsdatum: **01.03.2006**
Date of issue:

Gustav Hensel GmbH & Co. KG

ppa. 
R. Cater
- Technische Leitung -
- *Technical Director* -



Technical data
Declaration of EC Conformity
KV Small-type distribution boards

Erklärung
der EG-Konformität

Nr. K 6103

Declaration of EC-Conformity

Das Produkt,
The product

Typbezeichnung: **KV**
Type Reference: **KV**

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Isoliergehäuse, geeignet zum Bau von**
Niederspannungs-Schaltgeräte-Kombinationen bis 63 A,
zu deren Bedienung Laien Zugang haben
Description: **Enclosures, made of insulating material,**
suitable for assembling of low-voltage switchgear and controlgear
assemblies up to 63 A intended to be installed in places
where unskilled persons have access for their use

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **EN 60 439-3**
Standard, Document: **IEC 60 439-3**

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Niederspannungs-Richtlinie 2006/95/EG
Low voltage directive 2006/05/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
 CE-Kennzeichnung: **2002**
Year of affixing CE-Marking:

Ausstellungsdatum:
Date of issue: **23.01.2007**

Gustav Hensel GmbH & Co. KG

ppa. 
 R. Cater
 - Technische Leitung -
 - *Technical Director* -

Service

DK

KV

ENYSTAR

Mi

MC

LES

HENPAS

Technical data

**Erklärung
der EG-Konformität**

Nr. K 2008

Declaration of EC-Conformity

Das Produkt,
The product

Typbezeichnung: **Mi-System**
Type Reference: **Mi System**
type: Mi

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Niederspannungs-Schaltgerätekombination „TSK“**
Description: **Low-voltage switchgear and controlgear assemblies "TTA"**

*auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):*

Norm, Dokument: **EN 60 439-1**
Standard, Document: **IEC 60 439-1**

*und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):*

Niederspannungs-Richtlinie 2006/95/EG
Low voltage directive 2006/95/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 17050-1 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 17050-1 "General requirements for supplier's declaration of conformity". The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der
CE-Kennzeichnung: **2002**
Year of affixing CE-Marking:

Ausstellungsdatum: **23.01.2007**
Date of issue.

Gustav Hensel GmbH & Co. KG

ppa.
R. Cater 
- Technische Leitung -
- *Technical Director* -



Technical data
Declaration of EC Conformity
MC distribution boards MODITEC®

Erklärung
der EG-Konformität

Declaration of EC-Conformity

Nr. K 6602

Das Produkt,

Typbezeichnung: **MC-Verteiler**
Typ Reference: **MC Distribution board**

Hersteller: **Gustav Hensel GmbH & Co. KG**
Manufacturer: **Gustav-Hensel-Straße 6**
57368 Lennestadt

Beschreibung: **Niederspannungs-Schaltgerätekombination „TSK“**
Description: **Low-voltage switchgear and controlgear assemblies "TTA"**

auf das sich diese Erklärung bezieht, stimmt mit folgenden Normen oder normativen Dokumenten überein:
to which this declaration relates is in conformity with the following standard(s) or normative document(s):

Norm, Dokument: **EN 60439-1**
Standard, Document: **IEC 60439-1**

und entspricht den Bestimmungen der folgenden EG-Richtlinie(n):
and is in accordance with the provisions of the following EC-directive(s):

Niederspannungs-Richtlinie 2006/95/EG
Low voltage directive 2006/95/EG

Diese Konformitätserklärung entspricht der Europäischen Norm EN 45014 „Allgemeine Kriterien für Konformitätserklärungen von Anbietern“. Das Unternehmen Gustav Hensel GmbH & Co. KG ist Mitglied von ALPHA, Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V.. Diese Erklärung gilt weltweit als Erklärung des Herstellers zur Übereinstimmung mit den oben genannten internationalen und nationalen Normen.

This Declaration of Conformity is suitable to the European Standard EN 45014 „General criteria for supplier's declaration of conformity“. The company Gustav Hensel GmbH & Co. KG is member of ALPHA, Association for testing and certification of low voltage equipment. The declaration is world-wide valid as the manufacturer's declaration of compliance with the requirements of the a.m. national and international standards.

Jahr der Anbringung der CE-Kennzeichnung: **2003**
Year of affixing CE-Marking:

Ausstellungsdatum: **23.01.2007**
Date of issue:

Gustav Hensel GmbH & Co. KG

ppa.
R. Cater 
- Technische Leitung -
- *Technical Director* -



Technical data

Declaration of Conformity to RoHS Directive 2005/95 EC

With intended use Hensel products do not fall into the scope of the WEEE directive 2002/96/EC.

WEEE

Waste Electrical and Electronic Equipment

- Directive 2002/96/EC of the European Parliament and the Council of 27 January 2003 on waste electrical and electronic equipment

If Hensel products should be intended for use in products, which fall into the scope of the WEEE directive, the adherence to the requirements of the RoHS directive must be contractually agreed upon.

RoHS Directive 2002/95/EC

Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment

After the present level of knowledge Hensel products do not contain any substances in concentrations or applications of which their putting into circulation / marketing is prohibited as specified in the Prohibited Chemicals Ordinance, the DFD Halon Prohibition Ordinance and the Ordinance (EU) No. 2037/2000. In particular, it concerns polybrominated biphenyls (PBB) and polybrominated diphenylether (PBDE).

We state all these details according to the best of our knowledge. They correspond to the present state of the art. This information is not to be understood as a warranty in the sense of warranty law.

Service

DK

KV

ENYSTAR

Mi

MC

LES

HENPAS

Technical data