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### Marking of the IP protection degrees

The MSZ EN 60529:2015 standard gives detailed instructions on the system of IP protection degrees, related requirements and testing. The necessary protection degrees of the electrical products are defined by the relevant product standards, taking into consideration the requirements of MSZ EN 60529.

#### Protection against direct contact with dangerous parts and penetration of solid objects

First digit	Protection degree, Denomination	Description
0	No protection	No protection against direct contact with parts under voltage or moving. No protection against penetration of solid objects.
1	Protection against penetration of solid objects, 50 mm, or larger	Protection against direct access by large surface objects (e.g. by hand) to parts under voltage or moving, but no protection against intentional access to them. Protection against penetration of solid objects, 50 mm or larger in diameter.
2	Protection against penetration of solid objects, 12.5 mm, or larger	Protection against direct access by finger to parts under voltage or moving. Protection against penetration of solid objects, 12.5 mm or larger in diameter.
3	Protection against penetration of solid objects 2.5 mm, or larger	Protection against direct access to parts under voltage or moving, by tool, wire or any object thicker than 2.5 mm. Protection against penetration of solid objects, 2.5 mm or larger in diameter.
4	Protection against penetration of solid objects, 1 mm, or larger	Protection against direct access to parts under voltage or moving, by tool, wire or any object being thicker than 1 mm. Protection against penetration of solid objects, 1 mm or larger in diameter.
5	Limited ingress of dust permitted (no harmful deposit)	Protection against direct access to parts under voltage or moving, and against harmful ingress of dust. Dust penetration is not totally hindered, however dust cannot penetrate in such quantity to influence the operation and safety of the device.
6	Totally protected against ingress of dust.	Protection against direct access to parts under voltage or moving. Total protection against dust penetration.

#### Protection against water penetration

Second digit	Protection degree, Denomination	Description
0	No protection	Without any special protection
1	Protected against vertically falling drops of water.	Vertically falling drops of water can not cause damage.
2	Protected against vertically falling drops of water with enclosure tilted 15° from vertical.	Vertically falling drops of water can not cause damage. Enclosure tilted 15° from vertical.
3	Protected against sprays directed at 60° from vertical.	Water sprays directed at 60° from vertical cannot cause damage.
4	Protection against water splashing from all directions.	Water splashing from all directions cannot cause damage.
5	Protected against water jet.	Jets of water from all directions cannot cause damage.
6	Protected against strong jets of water.	Strong jets of water from all directions cannot cause damage.
7	Protected against effects of immersion.	Water can not penetrate into the enclosure if the device is immersed under water according to the standard specification.
8	Protected against long periods of immersion under pressure.	Water can not penetrate into the enclosure if the device is immersed under water according to the agreement between the manufacturer and the user. The agreed condition should be more severe than under item 7.
9	Protection against cleaning with high pressure water or steam.	Jets of high pressure water or steam from all directions can not cause damage. Water pressure: 100 bar, water temperature: 80 °C.

### Examples of application categories for low-voltage switch-gear and control-gear

Nature of current	Category	Typical applications	Relevant IEC product standard	
a. c.	<b>AC-1</b>	Non-inductive or slightly inductive loads, resistance furnaces	<b>60947-4</b>	
	<b>AC-2</b>	Slip-ring motors: starting, switching off		
	<b>AC-3</b>	Squirrel-cage motors: starting, switching off during running		
	<b>AC-4</b>	Squirrel-cage motors: starting, plugging <sup>1)</sup> , inching <sup>2)</sup> .		
	<b>AC-5a</b>	Switching of electric discharge lamp control.		
	<b>AC-5b</b>	Switching of incandescent lamps.		
	<b>AC-6a</b>	Switching of transformers.		
	<b>AC-6b</b>	Switching of capacitor banks.	<b>61095</b>	
	<b>AC-7a</b>	Slightly inductive loads in household appliances and similar applications		
	<b>AC-7b</b>	Motor-loads for household applications.	<b>60947-4</b>	
	<b>AC-8a</b>	Hermetic refrigerant compressor motor control with manual resetting of overload releases.		
	<b>AC-8b</b>	Hermetic refrigerant compressor motor control with automatic resetting of overload releases.		
	<b>AC-12</b>		Control of resistive loads and solid-state loads with isolation by opto-coupler.	<b>60947-5</b>
		<b>AC-13</b>	Control of solid-state loads with transformer isolation.	
		<b>AC-14</b>	Control of small electromagnetic loads.	
<b>AC-15</b>		Control of a. c. electromagnetic loads.		
<b>AC-20</b>		Connecting and disconnecting under no-load conditions.	<b>60947-3</b>	
<b>AC-21</b>		Switching of resistive loads, including moderate overloads.		
<b>AC-22</b>		Switching of mixed resistive and inductive loads, including moderate overloads.		
<b>AC-23</b>	Switching of motor loads or other highly inductive loads.			
a. c. and d. c.	<b>A</b>	Protection of circuits, with no rated short-time withstand current.	<b>60947-2</b>	
	<b>B</b>	Protection of circuits, with a rated short-time withstand current.		
d. c.	<b>DC-1</b>	Non-inductive or slightly inductive loads, resistance furnaces	<b>60947-4</b>	
	<b>DC-3</b>	Shunt-motors, starting, plugging <sup>1)</sup> , inching <sup>2)</sup> , dynamic breaking of motors.		
	<b>DC-5</b>	Series-motors, starting, plugging <sup>1)</sup> , inching <sup>2)</sup> , dynamic breaking of motors.		
	<b>DC-6</b>	Switching of incandescent lamps.	<b>60947-5</b>	
	<b>DC-12</b>	Control of resistive loads and solid-state loads with isolation by opto-couplers.		
	<b>DC-13</b>	Control of d. c. electromagnets.		
	<b>DC-14</b>	Control of d. c. electromagnetic loads having economy resistors in circuit.		
	<b>DC-20</b>	Connecting and disconnecting under no-load conditions.	<b>60947-3</b>	
	<b>DC-21</b>	Switching of resistive loads, including moderate overloads.		
<b>DC-22</b>	Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors).			
<b>DC-23</b>	Switching of highly inductive loads (e.g. series motors).			

<sup>1)</sup> Plugging is understood as stopping or reversing the motor by reversing its primary connections, while the motor is running.

<sup>2)</sup> Inching (jogging) is understood as energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

## Round copper wire cross-sections and testing currents according to IEC 60947-7-1

ISO cross-section (mm <sup>2</sup> )	AWG/MCM		Testing current (A)
	Size	Equivalent cross-section (mm <sup>2</sup> )	
0,2	24	0,205	4
-	22	-	
0,5	20	0,519	6
0,75	18	0,82	9
1	-	-	13,5
1,5	16	1,3	17,5
2,5	14	2,1	24
4	12	3,3	32
6	10	5,3	41
10	8	8,4	57
16	6	13,3	76
25	4	21,2	101
35	2	33,6	125
50	0	53,5	150
70	00	67,4	192
95	000	85	232
-	0000	107,2	
120	250MCM	127	269
150	300MCM	152	309
185	350MCM	177	353
240	500MCM	253	415
300	600MCM	304	520

## Time delay overload relays operation limits, in case all poles are energized

Type of the overload relay	Multiple factor of current setting value				Reference ambient temperature
	A	B	C	D	
Thermal type, compensated to the change of ambient temperature	1,05	1,2	1,5	7,2	+ 20 °C
	Breaking time				Breaking class
Starting	From cold state	From warm state	From warm state	From cold state	
Breaking	Must not happen within 2 hours	In 2 hours it must break	< 2 min	2...10 s	10A
			< 4 min	4...10 s	10
			< 8 min	6...20 s	20
			< 12 min	9...30 s	30

## Pollution degree

This is a standardized number based on the quantity or frequent occurrence of conductive or hygroscopic dust, ionised gas or relative air humidity, suitable to decrease the electrical strength or surface resistance of the product by hygroscopic absorption or air humidity condensation.

Pollution degree	Explanation
1	No pollution or only dry, non-conductive pollution occurs.
2	Normally only non-conductive pollution occurs. However sometimes conductivity can be expected, caused by precipitation of moisture.
3	Conductive pollution occurs or the dry non-conductive pollution becomes conductive due to the precipitation of moisture.
4	Pollution is constantly conductive, e.g. by conductive powder, rain or snow..

Unless otherwise stated by the relevant product standard, equipment for industrial applications is designed for use in degree 3 pollution environment, while equipment for household and similar applications is designed for use in degree 2 pollution environment.

**Tightening momentums for testing the mechanical strength of screw type terminals**

Thread diameter (mm)		Pulling momentum (Nm)		
Standard metric values	Diameter range	L	II.	III.
2,5	up to 2,8	0,2	0,4	0,4
3,0	2,8 – 3,0	0,25	0,5	0,5
-	3,0 – 3,2	0,3	0,6	0,6
3,5	3,2 – 3,6	0,4	0,8	0,8
4	3,6 – 4,1	0,7	1,2	1,2
4,5	4,1 – 4,7	0,8	1,8	1,8
5	4,7 – 5,3	0,8	2,0	2,0
6	5,3 – 6,0	1,2	2,5	3,0
8	6,0 – 8,0	2,5	3,5	6,0
10	8,0 – 10	-	4,0	10,0
12	10 – 12	-	-	14,0
14	12 – 15	-	-	19,0
16	15 – 20	-	-	25,0
20	20 – 24	-	-	36,0
24	over 24	-	-	50,0

I: Grub bolts, which do not stand out of the hole.

II: Bolts and nuts tightened with screwdriver.

III: Bolts and nuts tightened with other tools.

**Burning features of plastics**

The flammability features of plastics are defined by the Underwriters Laboratories (USA) in the UL 94 specification. This is valid for all application fields. During a horizontal or vertical test, the burning behaviour of the plastic raw material is tested in the laboratory, using open flame. The range of increasing flammability features are the HB, V1, V2, V0 and 5V classes.

**HB (Horizontal Burn)**

The sample to be tested is kept horizontally and lighted at one end. The burning speed should not be higher than 76 mm/min (over 3 mm thickness 38 mm/min).

**V2-V0 (Vertical Burn)**

The sample to be tested is kept vertically and lighted at the bottom end. So this test is more severe than the UL 94HB requirement.

**V2**

Self-extinguishing in less than 30 sec.  
Burning drops allowed.

**V1**

Self-extinguishing in less than 30 sec.  
Burning drops not allowed. Incandescence is allowed for max. 60 sec.

**V0**

Self-extinguishing in less than 10 sec.  
Burning drops not allowed. Incandescence is allowed for max. 30 sec.

**5V**

More severe flammability test. The sample to be tested vertically is subjected 5 times, always for 5 min., to a 127 mm long flame. After the last test, post-burning and burning drops are not allowed, incandescence is allowed for max. 60 sec.

**5VA**

Same as the 5VB test, but burnt hole is not allowed.

**5VB**

It is the same as the 5V test, but the sample to be tested is kept in horizontal position. Burnt hole is allowed after the flame is out.

Types of low-voltage distribution networks

Earth connection of the distribution network

- 1. character: **T** - direct earth connection at one point;  
**I** - insulated from earth or earth-connected through impedance;
- 2. character: **T** - the objects are directly connected to earth  
**N** - the objects are directly connected to the earth-connection point of the energy supply system
- Further characters: **S** - there is a separate protective conductor for the protection  
**C** - there is a common zero and protective conductor: PEN-conductor

Description of the letter-codes:

- T:** earth/ground (terre - French)
- N:** neutral conductor
- I:** insulated / impedance
- S:** separated
- C:** common
- PE:** protective earth conductor
- PEN:** common protective and neutral conductor (PE + N)

Marks on the drawings:

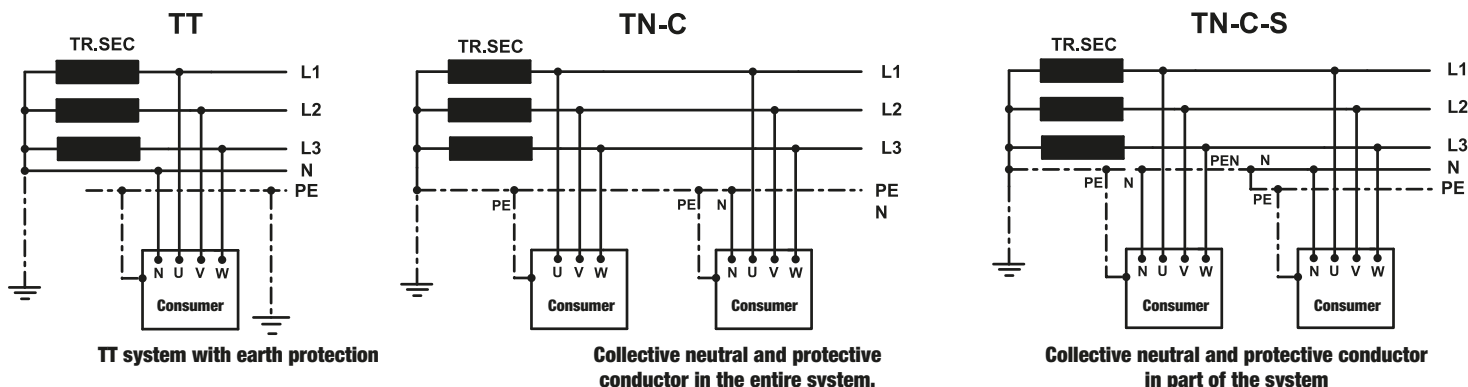
- TR.SEC:** secondary coils of distribution network transformers
- L1, L2, L3:** marking of the phase conductors
- U, V, W:** contact terminals of the consumer device
- \_\_\_\_\_ : phase conductor, neutral conductor
- . — . — : protective conductor

TN- system (neutral system)

One point within the TN- is directly earthed. The bodies of the device are connected to this point by a protective conductor.

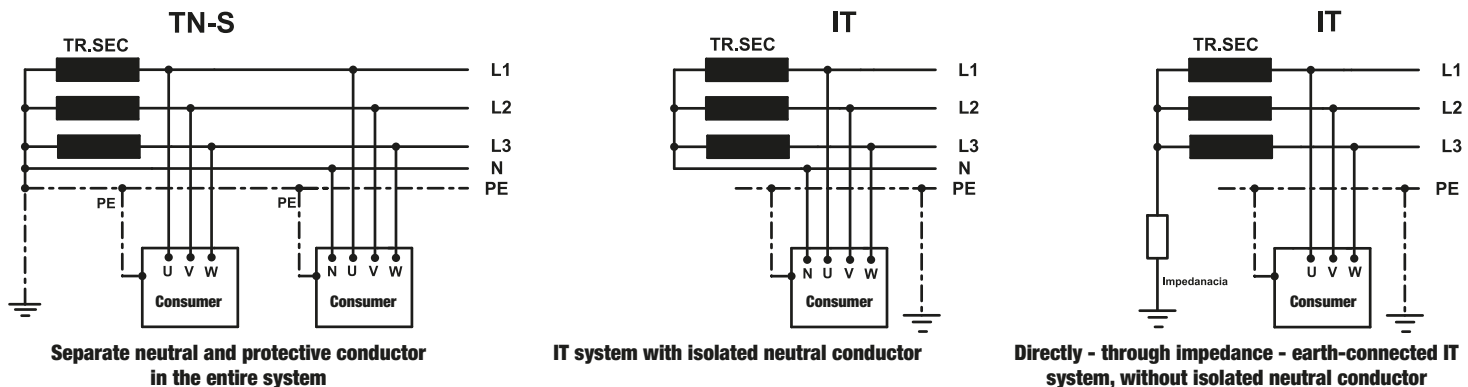
The TN- system types are: **TN-C, TN-C-S, TN-S**

**Important:** the already divided PE and N conductor should not be jointed again, and no PEN conductor should be used after the current protective switch – because in this case the current protective switch cannot operate!



TT- system (earth system with protective earth connection)

One point of the dividing system is directly earthed, the bodies of the devices are connected directly to earth connections, independently from the dividing system's earth connection.



IT-system (insulated system with protective earth connection)

One point of the distribution system is earthed through impedance or all the active parts are insulated from the earth, the bodies of the devices are earthed (they are connected to the earth system).

It is compulsory to build up the protective conductor, the neutral conductor is optional. Switching off is not imperative, when a short circuit with a small defect current occurs. The first defect between the active parts and the bodies or earth connections should be signalled. After the first defect, at the second defect coming, the defective equipment should be switched off within a given time period.

**Cable marking****STANDARD MARKING**

According to standard  
Accepted national type

**RATED VOLTAGE**

Below 100/100 V  
Till 100-300 V  
300/300 V  
300/500 V  
450/750 V

**CORE INSULATION**

PVC  
Natural rubber  
Silicon rubber  
Glass-cloth  
Paper  
Cross linked polyethylene

**SHIELDING LAYER**

Aluminium  
Copper  
Steel  
Tin  
Lead  
Common armour of cores

**OUTER JACKET**

PVC  
Glass-cloth  
Silicon rubber  
Natural rubber  
Polychloroprene  
Glass-cloth  
Artificial rubber  
Polyethylene

**SPECIAL CONSTRUCTION**

Inner form-out  
Cable shape

**CORE MATERIAL**

Copper  
Aluminium  
Special material

**CORE CONSTRUCTION**

Extra flexible  
Very flexible  
Twisted, round fibres  
Twisted, sectorial fibres  
Solid  
Solid, sectorial fibres

**CORE NUMBER****PROT. CONDUCTOR**

Not containing  
Containing

<b>H</b>	
<b>A</b>	
<b>00</b>	
<b>01</b>	
<b>03</b>	
<b>05</b>	
<b>07</b>	
<b>V</b>	
<b>R</b>	
<b>S</b>	
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<b>...</b>	
<b>X</b>	
<b>G</b>	



**Useful information about overvoltage protection**

The outer lightning protection of buildings protects the structures made of combustible materials and is not equivalent to the lightning and overvoltage protection of electric devices operating inside the building. If a lightning directly strikes the outer lightning protection system then a high voltage rise will appear through the earthing resistance of wire.

This rise will also go to the building's electric system (e.g. low voltage network, phone network, cable TV) and might lead to important damages. The purpose of internal overvoltage protection is to limit the overvoltages coming from direct or indirect lightning strikes (SEMP) or switching the inductive loads (LEMP). The next table contains the grouping of impulses and arresters according to EN 61643-1, EN 61643-11 and MSZ EN 62305 standards:

Impulse form	10/350 $\mu$ s	8/20 $\mu$ s
<b>Formation of impulse</b>	Lightning impulse: Imaging of voltage impulse occurred by direct lightning strike	Overvoltage-impulse: Imaging of e.g. switching procedure or far lightning strike
<b>Preferences of impulse</b>	Impulse with high charging and energy content, long duration	Impulse with quick running-up time, low energy content
<b>Type of device</b>	Type 1 lightning arresters	Type 2 and 3 surge arresters
	Type 1+2 combined arresters	

**LPZ lightning protection zone system**

The Type 1 lightning arresters must be placed on the main distribution board of the building right after the energy meter. In this way, the device will be placed on LPZ1 or rarely on LPZ0 lightning protection zone so these devices are planned to stop the lightning impulses with 10/350  $\mu$ s waveform. The Type 2 surge arresters have to be mounted to the side distribution boards or to the distribution boards of flats so placed on LPZ2 lightning protection zones.

The Type 3 arresters have to be mounted as close as possible from the protected device. As these devices are generally used inside the building, these arresters are placed on LPZ2 or LPZ3 lightning protection zones. The combined Type 1+2 arresters are usually used for retrofit installation so placed to the side distribution boards on LPZ2 zone. The Type 2, 3 and 1+2 arresters were planned to arrest overvoltages with 8/20  $\mu$ s waveform.

The devices of multi-level protection system have to be installed in parallel with the protected line and earth so the operation is going backwards on well coordinated system from the protected device towards the Type 1 arrester. First the Type 3 arrester will operate and if the energy of overvoltage impulse is too high then the voltage drop occurred by impedance of wire between Type 2 and 3 arresters will supplement the protection level of the Type 3 arrester.

If this added voltage level reaches the protection level of Type 2 arrester then this device will start to operate as well. If the energy of overvoltage impulse is still too high the Type 1 arrester will operate also by the method mentioned above.

If the energy of overvoltage impulse is low, maybe only the Type 3 or Type 3 and 2 arresters will operate. For well coordinated system, the proper length of wire between protection levels is very important; generally approximately having a 10 – 15 m long wire is enough between two levels.

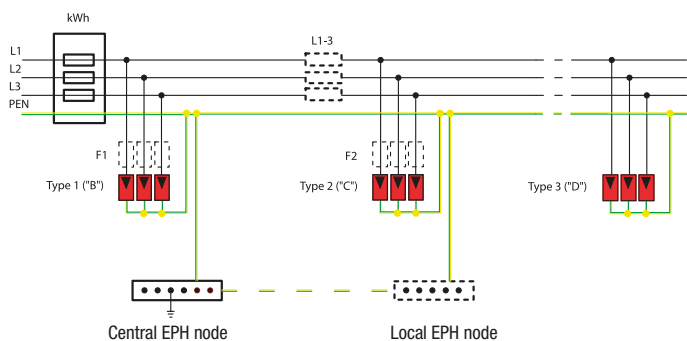
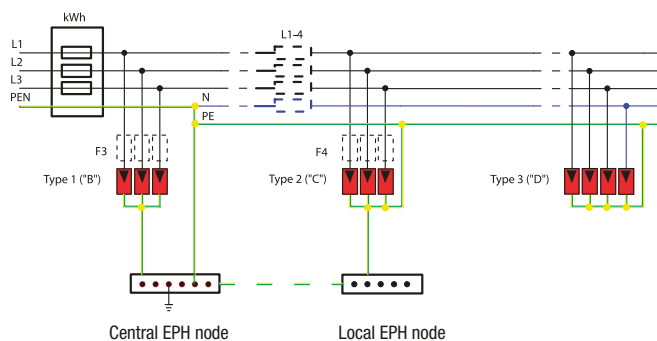
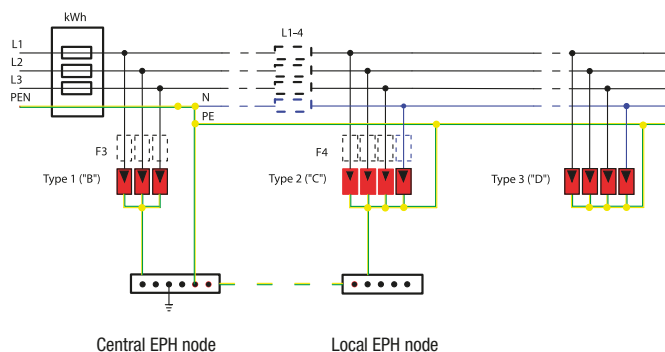
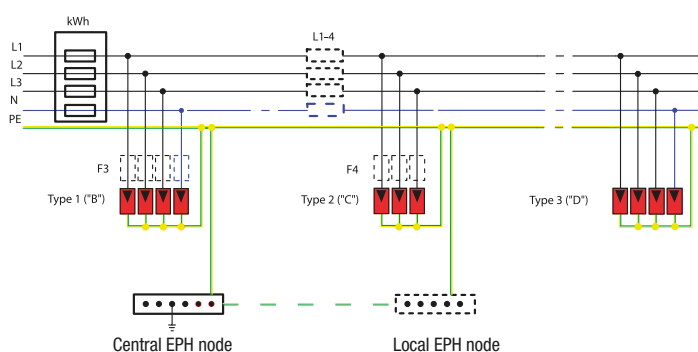
If this needed wire length cannot be ensured then a decoupling coil must be installed between two levels or a combined arrester has to be used.

Based on this, during the selection of the protection devices, the coordinated protection levels have to be compared to the peak value of the expected voltage impulses on the wire after protecting the device. If the protecting device is installed on borders of LPZ zones then the arrester has to be able to stop the standard impulses and to make electrical bounding of the lightning protection zone.

Type 3 devices are often able to stop overvoltages occurred by short circuit operation or switching or distance lightnings alone between phase, neutral and earth. If the energy of impulses (direct lightning or switching of high power loads) is higher Type 1 and 2 arrester must be installed as a Type 3 arrester cannot protect the device alone.

In conclusion, a well coordinated multilevel protection system must always be built up considering LPZ and SPZ zones, the standardized voltage impulse peaks and the installation conditions.

## Wiring examples for well coordinated TTV-type overvoltage arresters in different networks

**TN-C type network****Installation of type 1. (B) surge on metered network****TN-C-S type network****IF the type 2. (c) surge is nearer than 0.5 m from EPH****TN-C-S type network****IF the type 2. (c) surge is farther than 0.5 m from EPH****TN- S type network****Installation of type 1. (B) surge on metered network**

To build-up the well coordinated overvoltage protection system many properties have to be consider.

The most important properties are:

**Standing of building**

**Standing alone or**

**Standing on block or between other buildings;**

**Height of building:**

**Under 10m;**

**Under 30m, or**

**Higher, than 30m;**

**Does the building have outer lightning protection system;**

**Type of utility network**

**With insulated aerial bounded wire, or**

**With uninsulated strand;**

**Type of electrical connection of building:**

**Underground cable, or**

**Aerial bounded cable, can be**

**Insulated or**

**Uninsulated**

In Hungary as in other countries in Europe, the common buildings are placed in blocks or between other ones; their height is less than 10 m and they have no outer lightning protection system but underground cable or insulated aerial bounded wire electrical connection to the utility network.

From professional point of view, this type of buildings have less risk for direct lightning strikes and are considered safe against high energy overvoltages. Thus, there is no need to use Type 1 lightning arresters. Type 2 arrester is enough for a proper protection.

Of course if any of the properties of the building is different then a full three-level system must be installed for proper overvoltage protection.

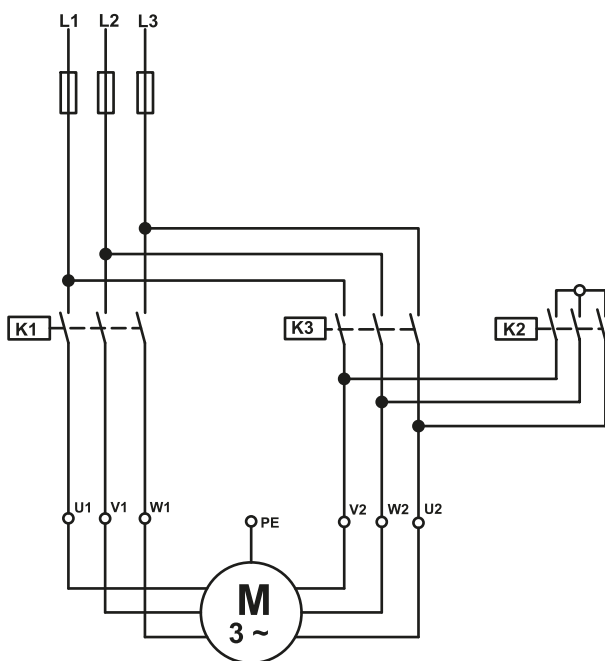
**Motor-starting combination**

By using the TR1D.. type contactors, auxiliary contacts, timing and heat relays, different combinations can be formed out, e.g. the star-delta automatic motor switch, or motor starter. We give below a short help for the design and harmonization of the necessary elements, wiring and forming of connections of them.

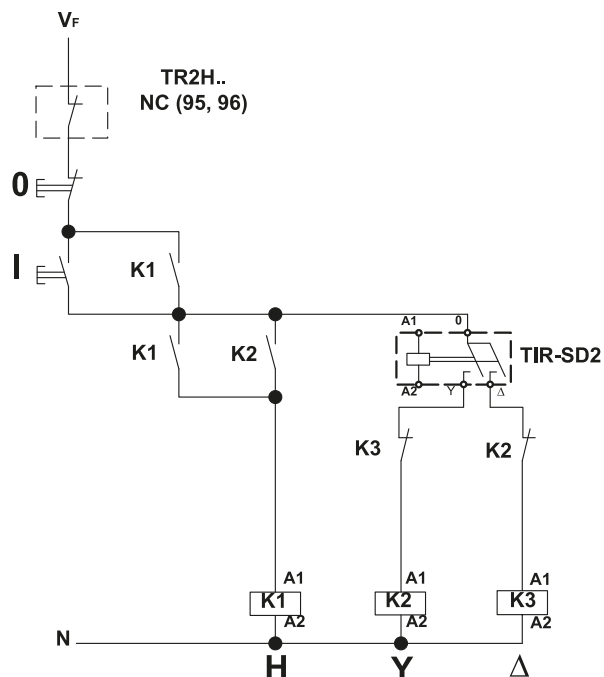
The star-delta (Y-Δ) motor-starter is consisted of 3 contactors, 2 auxiliary contacts, 1 timing unit and 1 heat relay.

**Star-delta starter**

The star-delta starter is one of the most frequently used starting units. When switching on, the motor starts in star connection. This way, the motor gets at start just  $1/\sqrt{3}$  of the normal operating voltage, (e.g. at 400 V operating voltage, at star switching 230 V on each coil). So the starting current is 1/3 of the direct starting current, approx. 2.5 times higher than the rated current. The rotational momentum of the motor is also 1/3 of the rated momentum. In delta operation the motor gets the full momentum.



**Main circuit wiring diagram**



**Control circuit wiring diagram**

**Description of the operation**

The „I” pushbutton operates the K2 contactor. When it pulls in, the auxiliary contact of it gives voltage to K1. K1 also pulls in and switches the motor into star. The K1 network contactor contains a time relay.


























Once the adjusted time has elapsed, K2 releases and K3 pulls in and switches the total network voltage onto the motor.

**Examples of harmonization of contactors, heat relays, timing and auxiliary contacts:**




Max. motor power	4 kW	9 kW	18 kW	22 kW	30 kW	45 kW
Contactor	3 pcs TR1D0910	2 pcs TR1D1810 1 pc TR1D1210	2 pcs TR1D4010 1 pc TR1D3210	3 pcs TR1D5011	2 pcs TR1D6511 1 pc TR1D5011	2 pcs TR1D9511 1 pc TR1D6511
Heat relay	TR2HD1314	TR2HD1321	TR2HD3353	TR2HD3357	TR2HD3361	TR2HD3365
Timing	TIR-SD2/TIR-SD3	TIR-SD2/TIR-SD3	TIR-SD2/TIR-SD3	TIR-SD2/TIR-SD3	TIR-SD2/TIR-SD3	TIR-SD2/TIR-SD3
Auxiliary contact	TR8-DN11	TR8-DN11	TR8-DN11	-	-	-

## Markings on the electrical products




## Sign

	Alternative current
	Direct current
	Three-phase alternative current
	Three-phase alternative current with neutral conductor
	II. protection class device
	III. protection class device
	For safe operation, the Instruction Manual should be consulted.
	Current protective switch, sensitive only for sinus alternative current defect currents
	Current protective switch, sensitive for pulsing direct current component alternative current defect currents
	Current protective switch, sensitive for direct and alternative currents
	Rated short circuit breaking ability with giving the value of the applied ballast fuse
	Lower value of the ambient temperature range
	Circuit breaker rated short circuit breaking ability and energy limiting class of it (I <sup>2</sup> t)
	Incandescent lamp loading
	Fluorescent tube loading
	Motor loading
	Extra low-voltage, safety, separating transformer
	Electronic converter for low-voltage incandescent lamps (e.g. halogen lamps)
	Iron base transformer for low-voltage incandescent lamps (e.g. halogen lamps)
	Direct opening operation control switch
	Can be used in vertical position
	Can be used in horizontal position
	Can be used in slanting eg. 60° position
	HAR marking for cables and wires
	Warning for danger of electrical shock
<b>Ex, Rb</b>	Explosion proof product
<b>AX</b>	Fluorescent tube loading current
<b>m</b>	Small contact space construction
<b>mikro</b>	Micro contact space construction
<b>T</b>	Ambient temperature

## Signs of switches

<b>I</b>	<b>On</b>	On position
<b>0</b>	<b>Off</b>	Off position
		Switch suitable for separation
		Constantly on
		Delay time

## Signs of contacts

	Contact of protective conductor
	Contact of earth connection
	Contact for controlled loading
<b>L1, L2, L3,</b>	Phase conductors of three-phase network
<b>U, V, W</b>	Contacts of three-phase device
<b>L1, L2</b>	Potential independent contacts of one-phase electrical device
<b>N</b>	Neutral conductor contact
<b>PEN</b>	Contact of protective conductor with neutral conductor
<b>A1, A2</b>	Contacts of operation coils
<b>X1, X2</b>	Contacts of signal lamps
<b>1-10</b>	Contacts of main contact
<b>..1, ..2</b>	Contacts of opening auxiliary contact
<b>..3, ..4</b>	Contacts of closing auxiliary contact
<b>95, 96</b>	Opening relay contact of surge protective device
<b>97, 98</b>	Closing relay contact of surge protective device
<b>X, Y, Z</b>	Contacts suitable for inner joints
<b>mm<sup>2</sup> or Δ∅</b>	Connectable wire size

EN 12275 .....	Mountaineering equipment. Connectors. Safety requirements and test methods
EN 13411 .....	Terminations for steel wire ropes. Safety.
EN 20898-7 .....	Mechanical properties of fasteners. Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm
EN 50262 .....	Metric cable glands for electrical installations
EN 50461 .....	Solar cells. Datasheet information and product data for crystalline silicon solar cells
EN 50513 .....	Solar wafers. Data sheet and product information for crystalline silicon wafers for solar cell manufacturing
EN 50521 .....	Connectors for photovoltaic systems. Safety requirements and tests
EN 60051-1 .....	Direct acting indicating analogue electrical measuring instruments and their accessories. Part 1: Definitions and general requirements common to all parts
EN 60061-2 .....	Lamp caps and holders together with gauges for the control of interchangeability and safety - Part 2: Lampholders
EN 60081 .....	Double-capped fluorescent lamps. Performance specifications
EN 60155 .....	Glow-starters for fluorescent lamps
EN 60238 .....	Edison screw lampholders
EN 60269 .....	Low-voltage fuses
EN 60309 .....	Plugs, socket-outlets and couplers for industrial purposes - Part 1: General requirements
EN 60335-1 .....	Safety of household and similar electrical appliances.
EN 60400 .....	Lampholders for tubular fluorescent lamps and starterholders
EN 60417-1 .....	Graphical symbols for use on equipment.
EN 60423 .....	Conduit systems for cable management. Outside diameters of conduits for electrical installations and threads for conduits and fittings
EN 60439 .....	Low-voltage switchgear and controlgear assemblies.
EN 60445 .....	Basic and safety principles for man-machine interface, marking and identification. Identification of equipment terminals, conductor terminations and conductors
EN 60454 .....	Specifications for pressure-sensitive adhesive tapes for electrical purposes.
EN 60514 .....	Acceptance inspection of class 2 alternating-current watt-hour meters
EN 60529 .....	Degrees of protection provided by enclosures (IP Code)
EN 60598 .....	Luminaires.
EN 60669 .....	Switches for household and similar fixed-electrical installations.
EN 60670 .....	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations.
EN 60684-1 ...-3 .....	Flexible insulating sleeving.
EN 60715 .....	Dimensions of low-voltage switchgear and controlgear. Standardized mounting on rails for mechanical support of electrical devices in switchgear and controlgear installations
EN 60730 .....	Automatic electrical controls for household and similar use.
EN 60831-1 .....	Shunt power capacitors of self-healing type for a.c. systems having a rated voltage up to and including 1 kV. Part 1: General. Performance, testing and rating. Safety requirements. Guide for installation and operation
EN 60838-1 .....	Miscellaneous lampholders. Part 1: General requirements and tests
EN 60838-2-2 .....	Miscellaneous lampholders. Part 2-2: Particular requirements. Connectors for LED-modules
EN 60898-1,-2 .....	Electrical accessories. Circuit-breakers for overcurrent protection for household and similar installations.
EN 60900 .....	Live working. Hand tools for use up to 1000 V a.c. and 1500 V d.c.
EN 60904-2 .....	Photovoltaic devices. Part 2: Requirements for reference solar devices
EN 60920 .....	Ballasts for tubular fluorescent lamps; general and safety requirements
EN 60921 .....	Ballasts for tubular fluorescent lamps. Performance requirements
EN 60926 .....	Starting devices (other than glow starters). General and safety requirements

EN 60927 .....	Auxiliaries for lamps. Starting devices (other than glow starters). Performance requirements
EN 60928 .....	Auxiliaries for lamps. A.C. supplied electronic ballasts for tubular fluorescent lamps. General and safety requirements
EN 60929 .....	AC and/or DC-supplied electronic control gear for tubular fluorescent lamps. Performance requirements
EN 60947 .....	Low-voltage switchgear and controlgear
EN 60947-3.....	Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
EN 60947-7.....	Low-voltage switchgear and controlgear. Part 7-1: Ancillary equipment.
EN 60968 .....	Self-ballasted lamps for general lighting services. Safety requirements
EN 60969 .....	Self-ballasted lamps for general lighting services. Performance requirements
EN 60998 .....	Connecting devices for low voltage circuits for household and similar purposes.
EN 60999 .....	Connecting devices. Electrical copper conductors. Safety requirements for screw-type and screwless-type clamping units.
EN 61008-1, -2.....	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's).
EN 61009-1, -2.....	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's).
EN 61010-1.....	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements
EN 61048 .....	Auxiliaries for lamps. Capacitors for use in tubular fluorescent and other discharge lamp circuits. General and safety requirements
EN 61049 .....	Capacitors for use in tubular fluorescent and other discharge lamp circuits; performance requirements
EN 61058-1.....	Switches for appliances. Part 1: General requirements
EN 61195 .....	Double-capped fluorescent lamps. Safety specifications
EN 61210 .....	Connecting devices. Flat quick-connect terminations for electrical copper conductors. Safety requirements
EN 61215 .....	Crystalline silicon terrestrial photovoltaic (PV) modules. Design qualification and type approval
EN 61238-1.....	Compression and mechanical connectors for power cables for rated voltages up to 36 kV (Um=42 kV). Part 1: Test methods and requirements (IEC 61238-1:2003, modified)
EN 61242 .....	Electrical accessories. Cable reels for household and similar purposes
EN 61326-2-2.....	Electrical equipment for measurement, control and laboratory use. EMC requirements.
EN 61347-2.....	Lamp controlgear. Part 2
EN 61386 .....	Conduit systems for cable management. Part 1: General requirements
EN 61439 .....	Low-voltage switchgear and controlgear assemblies.
EN 61439-1.....	Low-voltage switchgear and controlgear assemblies - Part 1: General rules
EN 61543 .....	Residual current-operated protective devices (RCDs) for household and similar use. Electromagnetic compatibility
EN 61549 .....	Miscellaneous lamps
EN 61558 .....	Safety of power transformers, power supply units and similar. Part 1: General requirements and tests
EN 61643-1...-341 ..	Low-voltage surge protective devices.
EN 61643-11.....	Low-voltage surge protective devices. Part 11: Surge protective devices connected to low-voltage power systems. Requirements and test methods
EN 61646 .....	Thin-film terrestrial photovoltaic (PV) modules. Design qualification and type approval
EN 61730-1,-2.....	Photovoltaic (PV) module safety qualification. Part 1: Requirements for construction
EN 61810 .....	Electromechanical elementary relays.
EN 61869 .....	Instrument transformers.
EN 61984 .....	Connectors. Safety requirements and tests
EN 62031 .....	LED modules for general lighting. Safety specifications
EN 62052-11.....	Electricity metering equipment (AC). General requirements, tests and test conditions. Part 11: Metering equipment
EN 62053 .....	Electricity metering equipment (a.c.). Particular requirements. Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2)

EN 62208 .....	Empty enclosures for low-voltage switchgear and controlgear assemblies. General requirements
EN 62275 .....	Cable management systems. Cable ties for electrical installations
EN 62384 .....	DC or AC supplied electronic control gear for LED modules. Performance requirements
EN 62423 .....	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
EN 62560 .....	Self-ballasted LED-lamps for general lighting services by voltage > 50 V. Safety specifications
EN 62612 .....	Self-ballasted LED lamps for general lighting services with supply voltages > 50 V. Performance requirements
EN ISO 11148-10.....	Hand-held non-electric power tools. Safety requirements. Part 10: Compression power tools
EN ISO 3506-1.....	Mechanical properties of corrosion-resistant stainless steel fasteners. Part 1: Bolts, screws and studs
EN ISO 4017 .....	Hexagon head screws. Product grades A and B
EN ISO 4032 .....	Hexagon regular nuts (style 1). Product grades A and B
EN ISO 898-1.....	Mechanical properties of fasteners made of carbon steel and alloy steel. Part 1: Bolts, screws and studs with specified property classes. Coarse thread and fine pitch thread
HD 60364-7-712 .....	Electrical installations of buildings. Part 7-712: Requirements for special installations or locations. Solar photovoltaic (PV) power supply systems
HD 60364-7-714 .....	Low-voltage electrical installations. Part 7-714: Requirements for special installations or locations. External lighting installations
HD 629.1 S2.....	Test requirements on accessories for use on power cables of rated voltage from 3,6/6 (7,2) kV up to 20,8/36 (42) kV. Part 1: Cables with extruded insulation
HD 639 S1 .....	Electrical accessories. Portable residual current devices without integral overcurrent protection for household and similar use
IEC 51.....	Direct acting indicating analogue electrical measuring instruments and their accessories.
IEC 60884.....	Plugs and socket-outlets for household and similar purposes.
IEC 60884-1 .....	Plugs and socket-outlets for household and similar purposes. Part 1: General requirements
IEC 61643-1 .....	Surge protective devices connected to low-voltage power distribution systems. Part 1: Performance requirements and testing methods
ISO 2380 .....	Screwdrivers for slotted-head screws.
ISO 5743 .....	Pliers and nippers. General technical requirements
ISO 5746 .....	Pliers and nippers. Engineer's and lineman's pliers. Dimensions and test values
ISO 5748 .....	Pliers and nippers. End cutting nippers. Dimensions and test values
ISO 5749 .....	Pliers and nippers. Diagonal cutting nippers. Dimensions and test values
ISO 8764 .....	Driver points to fit cross-recessed head screws
MSZ 263-4 .....	High-voltage insulators. Insulators with a nominal voltage up to and including 1 kV. Technical requirements and test specifications
MSZ 275-1...-3 .....	Fittings for overhead transmission lines.
MSZ 9871-2 .....	Dimensions of plugs and socket-outlets for domestic purposes. Two pole plug and socket-outlet with side earthing contacts, 250 V, 10/16 A
MSZ 9872.....	Adapter for plugs, rated 250 V/2,5 A for class II appliances
MSZ IEC 61643-1 .....	Surge protective devices connected to low-voltage power distribution systems. Part 1: Performance requirements and testing methods
MSZ-05-45.1601.....	Electrical jointing elements for conductors of the power industry for use up to 1000 V.





**1-9**

200J.....C/7	200K.....C/3	200L.....C/6	200N-GY.....C/5	200PR.....C/2	210PR.....C/2	220PR.....C/2	230NZ.....C/3	230PR.....C/2	250PR.....C/2	260-NY.....C/5	260PR.....C/2	260T.....C/6	265-12.....C/4	270PR.....C/2	280-NY.....C/5	280PR.....C/2	3 VF100-BTSH.....F/49	30/15SIN.....H/21	300-12.....C/4	300-CS.....C/8	300L.....C/6	300PR.....C/2	310-CS.....C/8	35/7,5 SIN.....F/13	35/7,5SIN-1000...M/13	35/7,5SIN-137....M/13	35/7,5SIN-20.....M/13	35/7,5SIN-500....M/13	35/7,5SIN-60.....M/13	35/7,5SIN-T-1000.M/13	35/7,5SIN-T-200...M/13	350-NY.....C/5	360-12.....C/4	370-CS.....C/8	370PR.....C/2	380L.....C/6	400-CS.....C/8
5458.....C/11	8138.....C/11	9006.....B/6	9039.....B/5	9843.....C/11	1000PR.....C/2	100N-GY.....C/5	110-CS.....C/8	120J.....C/7	120K.....C/3	120N-GY.....C/5	120PR.....C/2	130PR.....C/2	132-12.....C/4	150-CS.....C/8	150L.....C/6	150N-GY.....C/5	150P.....C/3	150PR.....C/2	150Z.....C/3	160-CS.....C/8	160N-GY.....C/5	160PR.....C/2	170K.....C/3	170P.....C/3	170PR.....C/2	170Z.....C/3	180-12.....C/4	180N-GY.....C/5	180-NY.....C/5	180PR.....C/2	190J.....C/7	190K.....C/3	190PR.....C/2	190Z.....C/3	200-CS.....C/8		

430PR.....C/2	450PR.....C/2	530PR.....C/2	5458N.....C/11	550PR.....C/2	580PR.....C/2	610PR.....C/2	760PR.....C/2	80PR.....C/2	850PR.....C/2	9004-LT.....B/5	9006R.....B/6	9006RS.....B/6	9039A.....B/5	9039AR.....B/5	9039A-SPEC.....B/5	9039B.....B/5	9039BR.....B/5	9039B-SPEC.....B/5	9039-HEXA.....B/5	9102-LT.....B/5
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**A**

A880L.....L/30	ACAM48-.....L/3	ACAM48-.....L/4	ACAM72-.....L/3	ACAM72-.....L/4	ACAM96-.....L/3	ACAM96-.....L/4	ACAMD-.....L/12	ACAMSD-10.....L/10	ACVM48-.....L/2	ACVM72-.....L/2	ACVM96-.....L/2	ACVMD-.....L/13
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ACVMS-.....L/9	AHC.....A/42-45	AKKU1.....B/9	AKKUT1.....B/9	AKM1-.....I/2	AKM1AL.....I/3	AKM1AX1.....I/3	AKM1AX2.....I/3	AKM1AXAL.....I/3	AKM1HD.....I/4	AKM1MD230.....I/5	AKM1MD400.....I/5	AKM1SHT230.....I/3	AKM1SHT24DC.....I/3	AKM1SHT400.....I/3	AKM1TM.....I/5	AKM1UVR.....I/3	AKM2-.....I/2	AKM2AL.....I/3	AKM2AX1.....I/3	AKM2AX2.....I/3	AKM2AXAL.....I/3	AKM2HD.....I/4	AKM2MD230.....I/5	AKM2MD400.....I/5	AKM2SHT230.....I/3	AKM2SHT24DC.....I/3	AKM2SHT400.....I/3	AKM2TM.....I/5	AKM2UVR.....I/3	AKM3-400.....I/2	AKM34AL.....I/3	AKM34AX1.....I/3	AKM34AX2.....I/3	AKM34AXAL.....I/3	AKM34HD.....I/4	AKM34MD230.....I/5	AKM34MD400.....I/5
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AKM34SHT230.....I/3	AKM34SHT24DC.....I/3	AKM34SHT400.....I/3	AKM34UVR.....I/3	AKM3TM.....I/5	AKM4-630.....I/2	AKM4TM.....I/5	AKR1-.....H/21	AM-60/250/3.....I/22	AM-60/250/3/120-10 I/22	AM-60/250/3/120-5..I/22	AM-60/630/3.....I/22	AMAX3.....C/20	AMAX5.....C/20	AMAX6.....C/20	AS120-.....A/7	AS150-.....A/7	AS16-.....A/7	AS16-70CS12.....A/12	AS185-.....A/7	AS185-240CS16...A/12	AS240-.....A/7	AS25-.....A/7	AS35-.....A/7	AS50-.....A/7	AS70-.....A/7	AS95-.....A/7	A-SST-60/3.....I/22	A-SST-60/4.....I/22	AT.....A/11	AT16-70CS.....A/11	AT185-240CS.....A/11	AT95-150CS.....A/11	AV1001200SH.....L/27	AV1001600SH.....L/27	AV1002000SH.....L/27	AV1002500SH.....L/27	AV1003000SH.....L/27
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AV30100SH.....L/26	AV30150SH.....L/26	AV30200SH.....L/26	AV3060SH.....L/26	AV3075SH.....L/26	AV40100SH.....L/27	AV40150SH.....L/27	AV40200SH.....L/27	AV40250SH.....L/27	AV40300SH.....L/27	AV40400SH.....L/27	AV40500SH.....L/27	AV601000SH.....L/27	AV601200SH.....L/27	AV60600SH.....L/27	AV60800SH.....L/27	AVBS-.....L/26
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**B**

B10.....M/2	B10-15.....M/2	B20.....M/2	BCSV-.....C/13	BD02.....B/21	BD05.....B/21	BD06.....B/21	BD069.....B/21	BD07.....B/21	BDT06.....B/21	BELL230.....F/48	BELL24.....F/48	BELL8.....F/48	BELL8S.....F/48	BELLW1-.....F/47	BK-130.....C/6	BSZ1-.....C/20
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BSZ2-.....C/20	CF72-0,5/1.....L/7	CLH70-.....A/5	D31E.....B/9	DCVMS-.....L/9	E08N-18.....A/22
BT-8/1.....F/43	CF72-0,5/3.....L/7	CLH95-.....A/5	D51-.....B/8	DCVMS-X/75.....L/9	E09.....A/23
BT-8/2.....F/43	CF96-0,5/1.....L/7	C0201A.....F/50	D51-.....B/9	DK60E.....B/10	E090.....A/23
BV0603.....M/9	CF96-0,5/3.....L/7	CS.....A/9	D52F-.....B/8	DKV105.....B/11	E09N.....A/22
BV0705.....M/9	CFD-72.....L/14	CS.....A/19	D55E.....B/9	DN200X200.....M/19	E09N-12.....A/22
BV1006.....M/9	CFD-96.....L/14	CSA-.....A/19	D60.....M/20	DN250X250.....M/19	E09N-18.....A/22
BV1108.....M/9	CL1.5-.....A/4	CSE.....A/19	D60S.....M/20	DPN.....F/12	E100.....A/23
BV1410.....M/9	CL10-.....A/4	CSEL.....A/19	D60SM.....M/20	DPN-C-.....F/30	E10N.....A/22
BV2015.....M/9	CL120-.....A/4	CSH.....A/18	D60T.....M/21	DTT-.....L/15	E10N-18.....A/22
BV2518.....M/9	CL150-.....A/4	CSKARA10.....C/21	D62-.....B/9	DTT-1-.....L/13	E110.....A/23
BV3225.....M/9	CL16-.....A/4	CSKARA12.....C/21	D62E.....B/9	DVK3X0.75.....G/8	E113.....A/23
BVZ0603.....M/9	CL185-.....A/4	CSKARA3,5.....C/21	D70.....M/20	DVK3X1.0.....G/8	E114.....A/23
BVZ0706.....M/9	CL2.5-.....A/4	CSKARA4.....C/21	D70/8.....M/20	DVK3X2,5-1,5.....G/8	E115.....A/23
BVZ1006.....M/9	CL240-.....A/4	CSKARA5.....C/21	D70D.....M/20	DVK3X2,5-3.....G/8	E116.....A/23
BVZ1108.....M/9	CL25-.....A/4	CSKARA6.....C/21	D70SET.....M/20	DVKE2X0.75.....G/8	E117.....A/23
BVZ1410.....M/9	CL300-.....A/4	CSKARA7.....C/21	D70SZ.....M/20	DVKE2X1.0.....G/8	E118.....A/23
BVZ2015.....M/9	CL35-.....A/4	CSKARA8.....C/21	D70SZT.....M/20		E119.....A/23
BVZ2518.....M/9	CL4-.....A/4	CSKARA9.....C/21	D70T.....M/21		E11N.....A/22
BVZ3225.....M/9	CL400-.....A/4	CSKT.....C/8	D70TRI.....M/20	<b>E</b>	E120.....A/23
BY50.....M/3	CL50-.....A/4	CSS-.....C/12	D80.....M/20	E010.....A/23	E121.....A/23
	CL500-.....A/4	CST1.....M/10	D80T.....M/21	E01N.....A/22	E122.....A/23
<b>C</b>	CL6-.....A/4	CST15B.....M/10	D80X80.....M/20	E020.....A/23	E123.....A/23
C120F-.....B/8	CL625-.....A/4	CST15W.....M/10	DC.....F/12	E030.....A/23	E124.....A/23
C60-.....F/43	CL70-.....A/4	CST25.....M/10	DC-1C-.....F/33	E02N.....A/22	E125.....A/23
C60-CSEN-.....F/42	CL95-.....A/4	CST25F.....M/10	DC-2C-.....F/33	E030.....A/23	E126.....A/23
C60-S2.....F/29	CLH1.5-.....A/5	CST4.....M/10	DC-3C-.....F/33	E034.....A/23	E127.....A/23
C60-U2/02.....F/29	CLH10-.....A/5	CST4-.....M/10	DC-4C-.....F/33	E03N.....A/22	E128.....A/23
CC100.....B/14	CLH120-.....A/5	CSTALP.....C/10	DCAM48-.....L/3	E040.....A/23	E129.....A/23
CC22.....B/14	CLH150-.....A/5	CSTALP-.....C/10	DCAM48-0,02.....L/3	E04N.....A/22	E12N.....A/22
CC250.....B/14	CLH16-.....A/5	CSTBOX.....M/10	DCAM72-.....L/3	E05.....A/23	E12N-18.....A/22
CC38.....B/14	CLH185-.....A/5		DCAM72-0,02.....L/3	E050.....A/23	E13.....A/23
CC500.....B/14	CLH2.5-.....A/5	<b>D</b>	DCAM96-.....L/3	E05N.....A/22	E130.....A/23
CC60.....B/14	CLH240-.....A/5	D100X100.....M/20	DCAM96-0,02.....L/3	E060.....A/23	E131.....A/23
CC80.....B/14	CLH25-.....A/5	D150X150.....M/20	DCAMS-20M.....L/9	E06N.....A/22	E132.....A/23
CF45S-0,5/1.....L/10	CLH35-.....A/5	D31-.....B/8	DCVM-.....L/5	E070.....A/23	E133.....A/23
CF45S-0,5/3.....L/10	CLH4-.....A/5	D31-.....B/9	DCVM48-.....L/2	E07N.....A/22	E134.....A/23
	CLH50-.....A/5		DCVM72-.....L/2	E080.....A/23	E135.....A/23
	CLH6-.....A/5		DCVM96-.....L/2	E08N.....A/22	E136.....A/23

E137.....A/23	EDFK-18/1AN .....H/6	EVOG2P ..... F/22	EVOTDA ..... F/12	F48-220/50 ..... L/7	FHH660 ..... C/22
E13I.....A/24	EDFK-2/1AN .....H/6	EVOG4P ..... F/22	EVOTDA-AL..... F/15	F50L.....B/2	FHH8110 ..... C/22
E13IR.....A/24	EDFK-2/1ANP .....H/7	EVOH ..... F/12	EVOTDA-AUX11 .... F/15	F520.....C/7	FK.....L/33
E13N .....A/22	EDFK-4/1AN .....H/6	EVOH1 ..... F/18	EVOTDA-SR ..... F/15	F521.....C/7	FLE- .....A/29
E14.....A/23	EDFK-4/1ANP .....H/7	EVOH2 ..... F/18	EVOTDA-UOVR ..... F/15	F6L.....B/2	FLEAL-..... A/30-31
E140.....A/23	EDFK-8/1AN .....H/6	EVOH3 ..... F/18	EVOU2P63 ..... F/28	F840.....C/7	FLS35/10X4.....A/29
E142.....A/23	EDFK-8/1ANP .....H/7	EVOH4 ..... F/18	EVOU02 ..... F/28	F841.....C/7	FLS35/4X9.....A/29
E144.....A/23	EDFKF- .....H/9	EVOH-AL..... F/15	EVOU02 ..... J/15	F96-220/50 .....L/7	FLS50/16X4.....A/29
E146.....A/23	EDFKIP65- .....H/6	EVOH-AUX11 ..... F/15	EVOU04 ..... F/28	FD-72.....L/14	FLS70/10X8.....A/29
E14N .....A/22	EDFKN-.....H/2	EVOHK2-..... F/27	EVOU04 ..... J/15	FD-96.....L/14	FLS0 ..... A/32-33
E14N-25.....A/22	EDFKS-.....H/3	EVOHK4-..... F/27	EVOU04P63 ..... F/28	FE100.....H/19	FLSOT35.....A/34
E15N-30.....A/22	EDFKSN-.....H/3	EVOH-SR ..... F/15	EVOV ..... F/13	FE15.....H/19	FLSOT95.....A/34
E16.....A/23	EDS- .....H/2	EVOH-UOVR ..... F/15	EV0V2P ..... F/21	FE150.....H/19	FLSOT95L.....A/34
E16I.....A/24	EDS, EDFK ..... F/13	EVOK ..... F/13	EV0V4P ..... F/21	FE30.....H/19	FSH10120 ..... C/22
E16IR.....A/24	EDSF- .....H/9	EVOK2B ..... F/20	EVOZ ..... F/12	FE45.....H/19	FSH12130 ..... C/22
E16N-32.....A/22	EDSN- .....H/2	EVOK2C ..... F/20	EVOZ1B ..... F/16	FE60.....H/19	FSH16140 ..... C/22
E19.....A/23	EDSS- .....H/4	EVOKE ..... F/13	EVOZ1C ..... F/16	FE75.....H/19	FSH550 ..... C/22
E19I.....A/24	EDSSN- .....H/4	EVOKEB ..... F/19	EVOZ2B ..... F/16	FEH10.....M/2	FSH570 ..... C/22
E20I.....A/24	EDTM .....H/7	EVOKEC ..... F/19	EVOZ2C ..... F/16	FEH10-15 .....M/2	FSH6100 ..... C/22
E22.....A/23	EKBV- .....H/13	EVOKM ..... F/13	EVOZ3B ..... F/16	FEH20.....M/2	FSH660 ..... C/22
E22I.....A/24	EL..... A/40-41	EVOKM2B ..... F/20	EVOZ3C ..... F/16	FEH50.....M/2	FSH8110 ..... C/22
E24.....A/23	EM264.....L/30	EVOKM2C ..... F/20	EVOZ4B ..... F/16	FEK10.....M/2	FSH870 ..... C/22
E24I.....A/24	EM306B.....L/31	EVOKOND .....G/2	EVOZ4C ..... F/16	FEK10-15 .....M/2	FSS10120.....C/22
E26.....A/23	EM422A.....L/32	EVOMS ..... F/25	EVOZ-AL ..... F/15	FEK20.....M/2	FSS12130.....C/22
E26I.....A/24	EPSA- .....L/28-29	EVOMS100/3 .....I/35	EVOZ-AUX11 ..... F/15	FEK50.....M/2	FSS550.....C/22
E28.....A/23	ESPD1+2- ..... F/4	EVOMS125/3 .....I/35	EVOZ-SR..... F/15	FEV250 .....H/19	FSS570.....C/22
E29.....A/23	ESPD1+2+3-..... F/6	EVOMS16/3 .....I/35	EVOZ-UOVR ..... F/15	FEV400.....H/19	FSS6100.....C/22
E30.....A/23	ESPD1+2-DC..... F/7	EVOMS20/3 .....I/35		FFE150-185 .....A/28	FSS660.....C/22
E32.....A/23	ESPD2- ..... F/5	EVOMS25/3 .....I/35		FFE35-50 .....A/28	FSS8110.....C/22
E50I.....A/24	ESPD2- ..... F/7	EVOMS40/3 .....I/35	<b>F</b>	FFE50-70 .....A/28	FSS870.....C/22
E50IH.....A/24	ESPD2+3- ..... F/6	EVOMS80/3 .....I/35	F125.....C/7	FFE70-95 .....A/28	FSZIG.....A/13
E90I.....A/24	ESPD3-10- ..... F/7	EVON ..... F/12	F200.....C/7	FFE95-240 .....A/28	FV-01 .....L/33
E90IH.....A/24	ESPD3-3-2P ..... F/7	EVONC ..... F/18	F201.....C/7	FHH10120 .....C/22	FV-06 .....L/33
ED- .....H/5	ESPD3-5- ..... F/7	EVOPB ..... F/26	F25L.....B/2	FHH12130 .....C/22	FV24.....L/33
EDFK- .....H/2	EV0BT15/1 ..... F/26	EVOPB2 ..... F/26	F290.....C/7	FHH16140 .....C/22	
EDFK-1/1AN .....H/6	EV0BT24/1 ..... F/26	EVOPBL ..... F/26	F291.....C/7	FHH550 .....C/22	
EDFK-1/1ANP .....H/7	EV0BT30/1 ..... F/26	EVOPS ..... F/26	F45S-230/50.....L/10	FHH570 .....C/22	
EDFK-12/1AN .....H/6	EVOG ..... F/13	EVOPSL ..... F/26		FHH6100 .....C/22	

<b>G</b>	HD156.....B/6	HR5-45.....C/19	<b>J</b>	JPL1.....C/24	KH.....B/6
	HD156R.....B/6	HR5-50.....C/19		JPL2.....C/24	KH4.....A/16
GBT.....C/15	HGS-01.....H/20	HR6-80.....C/19	J02-.....M/11	JPL3.....C/24	KHA4.....A/16
GCS-.....M/9	HK3.....G/10	HR8-100.....C/19	J02+.....M/11	JSET.....M/11	KL.....A/25
GD-.....M/19	HK3-3M.....G/10	HRRK2/2.....G/12	J020...J029.....M/11	JSET/B.....M/11	KL-1000.....B/14
GLK1-.....H/20	HK3-5M.....G/10	HRRK3/3.....G/12	J02GND.....M/11		KM1.....I/6
GLK2-.....H/20	HK36A.....L/31	HRRK6.....G/12	J02X.....M/11	<b>K</b>	KM1-.....I/7
GSZT.....C/15	HK3-USB.....G/12	HRRKF3/3.....G/12	J02Y.....M/11		KM1-HM.....I/8
GTL30.....C/14	HK4.....G/10	HRRKT6.....G/12	J10.....A/40-41	K10.....M/2	KM2.....I/6
GTL40.....C/14	HK4-3M.....G/10	HRRKTF3/3.....G/12	J15-.....M/11	K10-15.....M/2	KM2-.....I/7
GTL43.....C/14	HK4-5M.....G/10	HSZ.....A/20	J15/.....M/11	K20.....M/2	KM2G.....I/23
	HK5.....G/10	HUR-.....G/10	J15+.....M/11	K50.....M/2	KM2G/A30-40.....I/23
	HK5-3M.....G/10	HX120B.....B/7	J150...J159.....M/11	KACS1.....G/14	KM2G-F.....I/23
<b>H</b>	HK5-5M.....G/10	HX150B.....B/7	J15A...J15Z.....M/11	KACS2.....G/14	KM2G-F/A30-40...I/23
	HK6.....G/10	HX50B.....B/7	J15GND.....M/11	KB-1000.....B/14	KM2-HM.....I/8
H3.....G/10	HK6-3M.....G/10	HZS105-100.....D/17	J4.....A/40-41	KBD25ST.....K/42	KM3.....I/6
H3-3M.....G/10	HK6-5M.....G/10	HZS105-200.....D/17	J4-.....M/11	KBD25STT.....K/42	KM3-.....I/7
H3-5M.....G/10	HKD-.....G/9	HZS105-400.....D/17	J4+.....M/11	KBJ25LO.....K/42	KM4.....I/6
H4.....G/10	HKS-15.....B/12	HZS28-100.....D/17	J40...J49.....M/11	KBJ25LOT.....K/42	KM4-.....I/7
H4-3M.....G/10	HKS-15-.....B/12	HZS28-200.....D/17	J4A...J4Z.....M/11	KB-UNI.....B/19	KM4-HM.....I/8
H4-5M.....G/10	HKT5-3M.....G/11	HZS28-400.....D/17	J5.....A/40-41	KBY.....B/19	KM5.....I/6
H5.....G/10	HKTF5-3M.....G/11	HZS36-100.....D/17	J6.....A/40-41	KC-1000.....B/14	KM5-.....I/8
H5-3M.....G/10	HKTM5-3M.....G/11	HZS36-200.....D/17	J8.....A/40-41	KCS.....A/16	KM6.....I/6
H5-5M.....G/10	HKTM6-.....G/11	HZS36-400.....D/17	JC01.....M/11	KCS.....A/21	KM6-.....I/8
H6.....G/10	HKTM8-.....G/11	HZS54-100.....D/17	JC02.....M/11	KCSE.....A/20	KM7.....I/6
H6-3M.....G/10	HKTMF5-3M.....G/11	HZS54-200.....D/17	JC03.....M/11	KCSH.....A/21	KM7-.....I/8
H6-5M.....G/10	HKTMF6-.....G/11	HZS54-400.....D/17	JC04.....M/11	KD-.....G/6	KM7-.....I/8
HB-10X38-.....I/17	HKTMF8-.....G/11	HZS92-100.....D/17	JC05.....M/11	KD-DOB.....G/6	KM7-PM.....I/9
HB-14X51-.....I/17	HL.....A/40-41	HZS92-200.....D/17	JC06.....M/11	KDZ-.....G/7	KMH.....F/12
HB-22X58-.....I/17	HLF-02.....B/19	HZS92-400.....D/17	JC07.....M/11	KE3.....G/8	KMH-.....F/34
HB-8X32-.....I/17	HNKTM10-3M-KT.G/11		JC08.....M/11	KE4-3M.....G/8	KOHR10.....M/4
HBA-1P-.....I/16	HNKTM8-3M-KT...G/11	<b>I</b>	JC09.....M/11	KE4-5M.....G/8	KOHR24.....M/4
HBA-2P-.....I/16	HNKTMF8-3M-KT.G/11		JC10.....M/11	KET-.....D/14	KOR50.....M/4
HBA-3P-.....I/16	HR3-25.....C/19	IMP-.....F/42	JC11.....M/11	KETO-.....I/18-19	KRT.....C/13
HBM-10X38-.....I/17	HR3-30.....C/19	ISZ72-230.....L/8	JC12.....M/11	KF-1000.....B/14	KRT8.....C/13
HBM-14X51-.....I/17	HR4-30.....C/19	ISZ96-230.....L/8	JC13.....M/11	KF-1000-2.....B/14	KSET1000.....B/15
HBM-22X58-.....I/17	HR4-35.....C/19	ISZ96-24.....L/8	JC14.....M/11	KGy-.....D/15	KSPI-.....C/23
HBM-8X32-.....I/17	HR4-40.....C/19		JC15.....M/11		KSPI-.....C/23

KSZ .....A/14	LAK5/16-185 .....I/22	LSME9101 .....K/8	MG-25TG .....M/7	NARIDON .....J/11	NYAE102 .....K/44
KSZ16- .....A/14	LAK5/16-70 .....I/22	LTT .....M/23	MG-32 .....M/6	NARIMF .....J/13	NYBD .....K/42
KT01 .....G/31	LDM100 .....L/33	LY03B .....B/7	MG-32-A .....M/8	NARIMP .....F/42	NYBG .....K/43
KT02 .....G/31	LDM40 .....L/33	LY03BR .....B/7	MG-32F .....M/6	NARIST .....J/12	NYBJ .....K/42
KTCSH .....A/21	LF266 .....L/32	LY35C .....B/6	MG-40 .....M/6	NARS .....F/41	NYG3- .....K/26-32
KT-DOB .....G/7	LJL16- .....K/36	LY731 .....B/4	MG-40-A .....M/8	NARS .....J/14	NYG3- .....K/34-35
KTH .....A/17	LJL22- .....K/36		MG-40F .....M/6	NARV .....J/17	NYG442P30 .....K/39
KU00 .....I/23	LS15-COV .....K/4		MG-50 .....M/6	NARV1 .....J/16	NYG442P30T .....K/39
KU00/1/2X/A30-40 ..I/23	LS15G-B .....K/4	<b>M</b>	MG-50-A .....M/8	NPE-B6- .....M/14	NYG442P30TS .....K/39
KU00/2 .....I/23	LS15GD-B .....K/4		MG-50F .....M/6	NPE-B8- .....M/14	NYG542P40 .....K/39
KV .....A/15	LS15GM-B .....K/2	MACS16 .....B/3	MG-63 .....M/6	NPE-G6- .....M/14	NYG542P40T .....K/39
KVK .....F/13	LS15GQ21-B .....K/3	MACS6 .....B/3	MG-63-A .....M/8	NPE-G8- .....M/14	NYG542P40TS .....K/39
KVK- .....F/35	LS15GQ-B .....K/4	MB .....F/12	MG-63F .....M/6	NPE-Z- .....H/5	NYG542P40TS .....K/39
KVKB- .....F/35	LS15GW21-B .....K/3	MB-1B- .....F/31	MGF- .....M/6	NPE-Z- .....M/14	NYG642P60 .....K/39
KVKM .....F/13	LS15GW22-B .....K/3	MB-1C- .....F/31	MKM- .....I/11	NPE-Z-24 .....H/17	NYG642P60T .....K/39
KVKM- .....F/36	LS15GW2-B .....K/3	MB-2B- .....F/31	MKM1 .....I/10	NPE-Z-38 .....H/17	NYG642P60TS .....K/39
KVKMB- .....F/36	LS15GW-B .....K/2	MB-2C- .....F/31	MKM1- .....I/10	NPE-ZB .....M/14	NYGBA .....K/37
KVKVE .....F/13	LS15HW24-B .....K/2	MB-3B- .....F/31	MKM2 .....I/10	NPE-ZG .....M/14	NYGBA .....K/38
KVKVE- .....F/35	LS7100 .....K/6	MB-3C- .....F/31	MKM2- .....I/10	NT0- .....I/12	NYGBC .....K/39
KVKVEB- .....F/35	LS7110 .....K/6	MB-4C- .....F/31	MP1 .....C/24	NT00- .....I/12	NYGBK .....K/43
KW3- .....K/24-25	LS7120 .....K/5	MD- .....M/17	MP2 .....C/24	NT00C- .....I/12	NYGBL .....K/37
KYT- .....D/15	LS7121 .....K/6	MDL .....F/30	MSZ18 .....M/4	NT1- .....I/12	NYGBP .....K/37
	LS7124 .....K/6	MED- .....M/16	MSZ24 .....M/4	NT2- .....I/12	NYGBR .....K/39
	LS7140 .....K/5	MG-12 .....M/6	MSZ36 .....M/4	NT3- .....I/12	NYGBS .....K/39
<b>L</b>	LS7141 .....K/5	MG-12-A .....M/8	MSZ48 .....M/4	NTA- .....I/14	NYGBS .....K/39
	LS7144 .....K/6	MG-12F .....M/6		NTA-00C-00 .....I/14	NYGBV .....K/41
L10 .....M/2	LS7166 .....K/7	MG-12TG .....M/7		NTK .....I/15	NYGBW .....K/38
L20 .....M/2	LS7310 .....K/7	MG-16 .....M/6	<b>N</b>	NTM0- .....I/12	NYGD- .....K/32
LAK10/1,5-16 .....I/22	LS7311 .....K/7	MG-16-A .....M/8	NOF .....C/12	NTM00- .....I/12	NYGD-1GR .....K/38
LAK10/1,5-35 .....I/22	LS7312 .....K/7	MG-16F .....M/6	N1 .....C/12	NTM1- .....I/12	NYGD-FR .....K/34
LAK10/1,5-50 .....I/22	LSME8104 .....K/10	MG-16TG .....M/7	N10 .....M/2	NTM2- .....I/12	NYGI .....K/44
LAK10/16-120 .....I/22	LSME8107 .....K/10	MG-20 .....M/6	N2 .....C/12	NTM3- .....I/12	NYGL- .....K/44
LAK10/16-185 .....I/22	LSME8108 .....K/11	MG-20-A .....M/8	N20 .....M/2	NTR0 .....I/15	NYGR25/22 .....K/34
LAK10/16-70 .....I/22	LSME8111 .....K/9	MG-20F .....M/6	N3 .....C/12	NTR00 .....I/15	NYGR30/22 .....K/34
LAK5/1,5-16 .....I/22	LSME8112 .....K/10	MG-20TG .....M/7	N4 .....C/12	NTR1 .....I/15	NYGR38/22 .....K/34
LAK5/1,5-35 .....I/22	LSME8122 .....K/9	MG-25 .....M/6	NARIDOFF .....J/11	NTR2 .....I/15	NYK3- .....K/28-31
LAK5/1,5-50 .....I/22	LSME8166 .....K/9	MG-25-A .....M/8	NARIDOFFS .....J/12	NTR3 .....I/15	NYKK .....K/40
LAK5/16-120 .....I/22	LSME8169 .....K/8	MG-25F .....M/6		NYAE101 .....K/44	

<b>O</b>	PCSH .....A/21	<b>R</b>	RKARA8 .....C/21	<b>S</b>	SCALE-W72/4-P ..... L/6
	PD100X100 .....M/19		RKARA9 .....C/21		SCALE-W96/4-P ..... L/6
OFK16 .....C/23	PD75X35 .....M/19	RA120- .....A/8	RKV1000 .....B/13	S00 .....I/23	SCS .....A/16
OFK25 .....C/23	PD75X75 .....M/19	RA150- .....A/8	RKV300 .....B/13	S1 .....I/23	SCS6 .....A/21
OFK38 .....C/23	PD85X85 .....M/19	RA16- .....A/8	RKV700 .....B/13	S10 .....M/2	SCSH6 .....A/21
OFK9 .....C/23	PF11-3A .....J/8	RA16-70CS12 .....A/12	RL08- .....J/6	S10-15 .....M/2	SD101LD .....F/51
OKT15 .....C/9	PG- .....M/5	RA185- .....A/8	RL11- .....J/6	S10A-H .....A/35	SD133A .....F/51
OKT20 .....C/9	PG11-G .....M/5	RA185-240CS16 .....A/12	RL14- .....J/6	S10A-H-L .....A/35	SD2575SL .....B/16
OKT25 .....C/9	PG13,5-G .....M/5	RA240- .....A/8	RM08- .....J/2	S10A-U .....A/36	SD3060PH0 .....B/16
OKT28 .....C/9	PG16-G .....M/5	RA25- .....A/8	RM09- .....J/3	S15A-H .....A/35	SD3060PZ0 .....B/16
OLC11 .....A/26	PG21-G .....M/5	RA35- .....A/8	RM11- .....J/2	S15A-H-L .....A/35	SD375F .....B/15
OLC11D .....A/26	PG29-G .....M/5	RA50- .....A/8	RM12- .....J/3	S15A-U .....A/36	SD375S .....B/15
OLC21 .....A/26	PG36-G .....M/5	RA70- .....A/8	RM14- .....J/3	S15GQ22-B .....K/3	SD40100SL .....B/16
ONVSZ19 .....M/3	PG42-G .....M/5	RA95- .....A/8	RS90.22 .....J/8	S2 .....I/23	SD4100F .....B/15
ONVSZ25 .....M/3	PG48-G .....M/5	RA95-150CS12 .....A/12	RS90.23 .....J/8	S20 .....M/2	SD4100S .....B/15
ONVSZ38 .....M/3	PG7-G .....M/5	RB .....F/13	RSPMF-14 .....J/9	S3 .....I/23	SD5080PH1 .....B/16
OV02,5- .....A/27	PG9-G .....M/5	RB2- .....F/36	RSPSF- .....J/8	S30A-H .....A/35	SD5080PZ1 .....B/16
OVO-A .....A/27	PGF- .....M/5	RB4- .....F/36	RSPTF- .....J/9	S30A-H-L .....A/35	SD5080SLPZ1 .....B/17
OVOT2,5- .....A/27	PH4 .....A/16	RCS11 .....G/5	RSPYF- .....J/8	S30A-U .....A/36	SD5125F .....B/15
	PHA4 .....A/16	RCS11-IP .....G/5	RT08- .....J/4	S3A-H .....A/35	SD5125S .....B/15
	PK30/34X10 .....I/22	RCS13 .....G/5	RT11- .....J/4	S3A-H-L .....A/35	SD55125SL .....B/16
	PK40/34X10 .....I/22	RCS13-IP .....G/5	RT120/ .....A/10	S3A-U .....A/36	SD60100PH2 .....B/16
	PK50/34X10 .....I/22	RE1 .....A/40-41	RT150/ .....A/10	S50 .....M/2	SD60100PZ2 .....B/16
P0070 .....I/23	PK50/54X10 .....I/22	RE2 .....A/40-41	RT16/ .....A/10	S5A-H .....A/35	SD60100SLPZ2 .....B/17
P0095 .....I/23	PK60/34X10 .....I/22	REC .....A/42-45	RT185/ .....A/10	S5A-H-L .....A/35	SD6100F .....B/15
P1 .....I/23	PK60/54X10 .....I/22	RG317 .....B/4	RT240/ .....A/10	S5A-U .....A/36	SD6100S .....B/15
P10 .....M/2	PL .....A/25	RJ08- .....J/5	RT25/ .....A/10	S60A-H .....A/35	SD6125F .....B/15
P10-15 .....M/2	PR110- .....J/7	RJ11- .....J/5	RT35/ .....A/10	S60A-H-L .....A/35	SD6125S .....B/15
P12 .....I/23	PR12- .....J/7	RJ468 .....B/4	RT50/ .....A/10	S60A-U .....A/36	SD6150F .....B/15
P2 .....I/23	PR24- .....J/7	RJ86 .....B/4	RT70/ .....A/10	SAD60/3 .....I/22	SD6150S .....B/15
P20 .....M/2	PR48- .....J/7	RKARA10 .....C/21	RT95/ .....A/10	SAD60/4 .....I/22	SD65150SL .....B/16
P22 .....I/23	PSZ .....A/14	RKARA11 .....C/21	RV02,5- .....A/26	SCALE-45 DC-X .....L/9	SD80150PH3 .....B/16
P3 .....I/23	PSZ10- .....A/14	RKARA12 .....C/21	RVON .....A/27	SCALE-AC48-X/5A .....L/4	SD80150PZ3 .....B/16
P32 .....I/23	PSZ35- .....A/14	RKARA13 .....C/21		SCALE-AC72-X/5A .....L/4	SDDK4100S .....B/15
P50 .....M/2	PTCSH .....A/21	RKARA4 .....C/21		SCALE-AC96-X/5A .....L/4	SDDK5125S .....B/15
PCS .....A/16	PTH .....A/17	RKARA5 .....C/21		SCALE-DC48-X/75MV .....L/5	SDDK6150S .....B/15
PCS .....A/21	PV .....A/15	RKARA6 .....C/21		SCALE-DC72-X/75MV .....L/5	SF .....A/40-41
PCSE .....A/20	PYF14A .....J/9	RKARA7 .....C/21		SCALE-DC96-X/75MV .....L/5	SF10A-H .....A/35

SF10A-H-L.....A/35	SLJL-DC24-.....F/25	SZ150-.....A/3	T10-PA.....C/17	TALP280.....C/11	TDA-3B-.....F/17
SF10A-U.....A/36	SOLAR11-.....A/28	SZ15A-U.....A/36	T10PCSPA.....C/17	TALP281.....C/11	TDA-3C-.....F/17
SF15A-H.....A/35	SOLAR11-PT.....B/3	SZ16-.....A/2	T10P-PA.....C/17	TB-.....M/23	TDA-4B-.....F/17
SF15A-H-L.....A/35	SOLAR1-2AB.....A/28	SZ16-.....A/2	T10-UNI.....C/15	TB525.....C/16	TDA-4C-.....F/17
SF15A-U.....A/36	SP10A-U.....A/36	SZ185-.....A/3	T12-PA.....C/17	TB535.....C/16	TDB01-.....G/27
SF30A-H.....A/35	SP15A-U.....A/36	SZ2.5-.....A/2	T12P-PA.....C/17	TB545.....C/16	TDB02-.....G/27
SF30A-H-L.....A/35	SPI10.....C/22	SZ20.....M/2	T140.....C/3	TB635.....C/16	TDB03-.....G/27
SF30A-U.....A/36	SPI12.....C/22	SZ240-.....A/3	T14-PA.....C/17	TB645.....C/16	TDB04-.....G/27
SF3A-H.....A/35	SPI15.....C/22	SZ25-.....A/2	T186.....C/3	TB655.....C/16	TDB05-.....G/28
SF3A-H-L.....A/35	SPI20.....C/22	SZ35-.....A/2	T200.....C/3	TB670.....C/16	TDB06-0M.....G/28
SF5A-H.....A/35	SPI25.....C/22	SZ4-.....A/2	T208.....C/3	TB8100.....C/16	TDB07-0M.....G/28
SF5A-H-L.....A/35	SPI6.....C/22	SZ50.....M/2	T281.....C/3	TB8120.....C/16	TDB08-0M.....G/28
SF60A-H.....A/35	SPI8.....C/22	SZ50-.....A/3	T293.....C/3	TB8135.....C/16	TDB09-.....G/29
SF60A-H-L.....A/35	SRTB25.....M/4	SZ70-.....A/3	T338.....C/3	TB845.....C/16	TDB10-.....G/29
SF60A-U.....A/36	SRTB50.....M/4	SZ95-.....A/3	T360.....C/3	TB860.....C/16	TDB11-0M.....G/29
SFC.....A/42-45	SRTYB25.....M/4	SZ-CL.....A/6	T5-UNI.....C/15	TB875.....C/16	TDB12-12MV.....G/29
SFD.....A/37	SRTYB50.....M/4	SZ-CLSN.....A/6	T6CS-PA.....C/17	TBSZ-.....B/18	TDB231377.....G/30
SH4.....A/16	SS10A-U.....A/36	SZEL.....A/40-41	T6H.....C/14	TBSZF-.....B/18	TDB302210.....G/30
SHA4.....A/16	SS15A-U.....A/36	SZICS.....A/20	T6K.....C/14	TBSZS-.....B/18	TDB333315.....G/30
SHK-.....F/40	SST-60/1.....I/22	SZICSH.....A/20	T6-PA.....C/17	TBT-.....A/25	TDB351377.....G/30
SHK2-.....F/40	SST-60/3.....I/22	SZIV-.....C/18	T6PCS-PA.....C/17	TCSA.....G/13	TDB351710.....G/30
SHK2-.....F/40	SST-60/4.....I/22	SZL1.....M/17	T6-UNI.....C/15	TCSAF.....G/13	TDB362613.....G/30
SHK3-.....F/40	SSTM-.....K/46-47	SZL3MD.....M/17	T8CS-PA.....C/17	TCSAH.....G/13	TDB461377.....G/30
SHK4-.....F/40	STCSH6.....A/21	SSZ25-.....A/14	T8-PA.....C/17	TCSAH-F.....G/13	TDB503315.....G/30
SHK4-.....F/40	STH.....A/17	SSZ3.....A/14	T8PCS-PA.....C/17	TCSAL.....G/13	TDB683315.....G/30
SK10A-U.....A/36	STS-.....H/21		T8P-PA.....C/17	TCSALH.....G/13	TDB-CABLE.....G/28
SK15A-U.....A/36	SV.....A/15		T8-UNI.....C/15	TCSD.....G/13	TDT.....H/7
SK30A-U.....A/36	SV50.....M/3	<b>T</b>	T92.....C/3	TCSDF.....G/13	TDT-2.....H/7
SK60A-U.....A/36	SVK1-.....F/24		TALP190.....C/11	TCSDH.....G/13	TDUG0.....G/15
SL.....A/25	SVK2-.....F/24	T10080P.....C/14	TALP190-2.....C/10	TCSDL.....G/13	TDUG09.....G/15
SL00-.....I/20	SVK3-.....F/24	T10100P.....C/14	TALP191.....C/11	TCSDLH.....G/13	TDUG09-BARN.....G/15
SL1-.....I/20	SVK4-.....F/24	T10120P.....C/14	TALP191-2.....C/10	TCSD0.....G/13	TDUG0-BARN.....G/15
SL2-.....I/20	SZ1.5-.....A/2	T10140P.....C/14	TALP200.....C/11	TCSDR.....G/14	TDUGOF.....G/15
SL3-.....I/20	SZ10.....M/2	T10160P.....C/14	TALP201.....C/11	TCSDRB.....G/14	TDZ.....F/12
SLJL-AC230-.....F/25	SZ10-.....A/2	T10200P.....C/14	TALP270.....C/11	TDA-1B-.....F/17	TDZ-1B-.....F/32
SLJL-AC230-.....F/25	SZ10-15.....M/2	T10240P.....C/14	TALP270-2.....C/10	TDA-1C-.....F/17	TDZ-1C-.....F/32
SLJL-AC24-.....F/25	SZ10A-U.....A/36	T10300P.....C/14	TALP271.....C/11	TDA-2B-.....F/17	TDZ-1D-.....F/32
SLJL-DC220-.....F/25	SZ120-.....A/3	T10CS-PA.....C/17	TALP271-2.....C/10	TDA-2C-.....F/17	TDZ-2B-.....F/32

TDZ-2C- ..... F/32	TFE605025.....H/11	TFSS-1Z ..... M/12	TGEMP150.....H/17	TKB- ..... I/28	TME332513T .....H/8
TDZ-2D- ..... F/32	TFE606025.....H/11	TFSS-2 ..... M/12	TGEMP200.....H/17	TKCR-0708.....C/12	TME403017 .....H/8
TDZ-3B- ..... F/32	TFE606030.....H/11	TFSS-2V ..... M/12	TGESL.....H/17	TKCRZ- .....C/13	TME403017M .....H/8
TDZ-3C- ..... F/32	TFE705020.....H/11	TFSS-2Z ..... M/12	TGF.....B/18	TKCS .....B/4	TME403017MT .....H/8
TDZ-3D- ..... F/32	TFE705025.....H/11	TFSS-3 ..... M/12	TGV2- .....I/50-53	TKF- .....I/30	TME403017R .....H/8
TDZ-4B- ..... F/32	TFE806020.....H/11	TFSS-3-12.....M/12	TH .....A/10	TKFK- .....I/30	TME403017T .....H/8
TDZ-4C- ..... F/32	TFE806020M.....H/10	TFSS-3V ..... M/12	TH10100 .....C/16	TKFL- .....I/30	TME403020 .....H/8
TDZ-4D- ..... F/32	TFE806020T.....H/10	TFSS-3V-12.....M/12	TH10115 .....C/16	TKH- .....C/23	TME403020T .....H/8
TDZ-F2 ..... F/29	TFE806025.....H/11	TFSS-3Z ..... M/12	TH10135 .....C/16	TKI-F .....I/30	TME504018 .....H/8
TEMS1- ..... I/40	TFE806030.....H/11	TFSS-4 ..... M/12	TH10160 .....C/16	TKM- .....I/28-30	TME504018M .....H/8
TEMS2- ..... I/40-41	TFG.....F/13	TFSS-4V ..... M/12	TH1080 .....C/16	TKO- .....G/2	TME504018MT .....H/8
TEMS3- ..... I/40-41	TFG2- ..... F/38	TFSS-4Z ..... M/12	TH8100 .....C/16	TKR-12T .....C/9	TME504018R .....H/8
TES- ..... K/48-51	TFG4- ..... F/38	TFSSCOV ..... M/12	TH8120 .....C/16	TKR130 .....C/9	TME504018T .....H/8
TFE- ..... H/12	TFGA .....F/13	TFV .....F/13	THC10100 .....C/16	TKR200 .....C/9	TME604020 .....H/8
TFE1006025.....H/11	TFGA- .....F/38	TFV2- .....F/37	THC10115 .....C/16	TKR-20T .....C/9	TME604020M .....H/8
TFE1008025.....H/11	TFIG.....F/13	TFV4- .....F/37	THC10135 .....C/16	TKR300 .....C/9	TME604020MT .....H/8
TFE1008030.....H/11	TFIG2- .....F/39	TFVH.....F/13	THC10160 .....C/16	TKR310 .....C/9	TME604020R .....H/8
TFE1008040.....H/11	TFIG4- .....F/39	TFVH4- .....F/37	THC1080 .....C/16	TKT- .....I/35	TME604020T .....H/8
TFE1208030.....H/11	TFJA- .....L/21-25	TG007 .....B/18	THC8100 .....C/16	TKT-65 .....I/25	TME605022 .....H/8
TFE252015.....H/11	TFK101.....F/46	TG008 .....B/18	THC8120 .....C/16	TKT-65/2 .....I/25	TME605022M .....H/8
TFE302515.....H/11	TFK101B.....F/46	TGE6010520 .....H/14	THC8135 .....C/16	TKT-65/3 .....I/25	TME605022MT .....H/8
TFE303015.....H/11	TFK102.....F/46	TGE6012020 .....H/14	THMS- .....H/20	TKT-65/4 .....I/25	TME605022T .....H/8
TFE403015.....H/11	TFK105.....F/46	TGE6015020 .....H/14	THSN .....A/17	TKTS-01 .....I/25	TME705025 .....H/8
TFE403020.....H/11	TFK106.....F/46	TGE6018020 .....H/14	TICS- .....G/16-26	TKTS-02 .....I/25	TME705025M .....H/8
TFE403020M.....H/10	TFKSCH- .....F/46	TGE606020 .....H/14	TICSCAP .....G/19	TKTS-03 .....I/25	TME705025MT .....H/8
TFE403020T .....H/10	TFKV- .....J/18-21	TGE607520 .....H/14	TICS-RE230 .....G/31	TKU-F .....I/30	TME705025R .....H/8
TFE404020.....H/11	TFM.....A/24	TGE609020 .....H/14	TICS-RE400 .....G/31	TKU-K.....I/30	TME705025T .....H/8
TFE404025.....H/11	TFSS.....F/13	TGEBF .....H/17	TIK1- .....F/23	TKU-V .....I/30	TMK.....C/18
TFE504015.....H/11	TFSS V.....F/13	TGEBM150 .....H/17	TIK2- .....F/23	TKV- .....I/26-28	TMM.....C/18
TFE504020.....H/11	TFSS-1 .....M/12	TGEBM200 .....H/17	TIK3- .....F/23	TLA-3 .....F/41	TMSZ.....C/18
TFE504020M.....H/10	TFSS-1+N .....M/12	TGECE .....H/17	TIK4- .....F/23	TMCS .....C/18	TMSZ- .....M/7
TFE504020T .....H/10	TFSS100-1 .....M/12	TGEF6010520.....H/15	TK- .....I/26	TME282113.....H/8	TMZ- .....M/8
TFE504025.....H/11	TFSS-1-12.....M/12	TGEF6012020.....H/15	TK/T1+F1/ .....I/25	TME282113M.....H/8	TN10 .....C/16
TFE604020.....H/11	TFSS125-1 .....M/12	TGEF6015020.....H/15	TK/T2+F1/ .....I/25	TME282113MT .....H/8	TN12 .....C/16
TFE605015.....H/11	TFSS-1CS.....F/13	TGEF6018020.....H/15	TK/T2+F2/ .....I/25	TME282113T.....H/8	TN14 .....C/16
TFE605020.....H/11	TFSS-1CS .....M/12	TGEF606020.....H/15	TK/T3+F3/ .....I/25	TME332513 .....H/8	TN2 .....G/14
TFE605020M.....H/10	TFSS-1V .....M/12	TGEF607520.....H/15	TK/T3+F3S/ .....I/25	TME332513M.....H/8	TN2/1 .....G/16
TFE605020T .....H/10	TFSS-1V-12.....M/12	TGEF609020.....H/15	TKA .....I/25	TME332513MT .....H/8	TN3 .....G/14



TN4 .....G/14	TR2AD .....I/47	TTV1+2- .....F/8	U11 .....C/19	V360-KNY.....H/18	VF100- .....F/49
TN6 .....C/16	TR2HD13.....I/47	TTV2-40-.....F/8-9	U13 .....C/19	V375.....H/18	VFG100.....F/49
TN8 .....C/16	TR2HD33.....I/47	TTV2-60- .....F/9	U14 .....C/19	V375-KNY.....H/18	VFM100- .....F/49
TNCS10 .....C/16	TR2HF23 .....I/47	TTV3-10-1P+N/PE...F/10	U16 .....C/19	V4- .....A/9	VFS100.....F/49
TNCS12 .....C/16	TR2HK03 .....I/46	TTV3-10-3P+N/PE...F/10	U19 .....C/19	V43.....H/18	VKP.....A/13
TNCS6 .....C/16	TR5KN .....I/44	TTV3-5-1P+N-PE....F/11	U22 .....C/19	V43-KNY .....H/18	VL.....A/40-41
TNCS8 .....C/16	TR6DN.....I/44	TTV-CSF35 .....F/11	U25 .....C/19	V71.....H/18	VLC.....A/42-45
TND2.....G/15	TR7DR2.....I/45	TTVL2+3-10.....F/11	UD70 .....M/21	V71-KNY.....H/18	VLD .....A/37
TND2-K .....G/15	TR7DT2 .....I/45	TU140 .....C/4	UDT60 .....M/21	VAKFED60.....M/21	VM102.....K/20
TND2-USB.....G/15	TR8- .....I/45	TU186 .....C/4	UH10 .....G/7	VAKFED70.....M/21	VM106.....K/21
TND3.....G/15	TR9- .....I/45	TU200 .....C/4	UH15 .....G/7	VD .....G/31	VM110.....K/20
TNF2 .....G/16	TRC252 .....A/26	TU208 .....C/4	UH20 .....G/7	VE10045.....D/10	VM115.....K/21
TNF2/1 .....G/16	TRC253 .....A/26	TU281 .....C/4	UH20RN.....G/7	VE12550.....D/10	VM121.....K/21
TNFS .....M/13	TRC254 .....A/26	TU293 .....C/4	UH25 .....G/7	VE3259.....D/9	VM145.....K/22
TNFS10 .....M/13	TRC255 .....A/26	TU338 .....C/4	UH30 .....G/7	VE33816.....D/9	VM171.....K/22
TNFS16 .....M/13	TRF0.....D/18	TU360 .....C/4	USB-21.....F/46	VE3512.....D/10	VM181.....K/22
TNFS25 .....M/13	TRF1.....D/18	TU92 .....C/4	USBD.....G/9	VE3512C.....D/10	VP102.....K/14
TNFS2516 .....M/13	TRF2.....D/18	TVO-1D216F.....L/20	USF .....A/40-41	VE3512-SZ .....D/11	VP106.....K/14
TNFSB .....M/13	TRF3.....D/18	TVO-F1- .....L/19	USL1- .....I/20	VE38036.....D/9	VP110.....K/14
TNFSB1 .....M/13	TRF4.....D/18	TVOF11.....L/18	UTILK.....B/20	VE4021 .....D/10	VP118.....K/12
TNS2 .....G/16	TRF5.....D/18	TVOF12.....L/18		VE4021C.....D/10	VP121.....K/12
TOP10 .....C/17	TRF6.....D/18	TVOF14.....L/18		VE4021-SZ .....D/11	VP127.....K/15
TOP6 .....C/17	TRF7 .....D/18	TVOF1M4.....L/18	<b>V</b>	VE510046.....D/11	VP145.....K/13
TOP8 .....C/17	TRK4 .....A/25	TVO-F3- .....L/20		VE54019.....D/11	VP171.....K/15
TOPCS10.....C/17	TS- .....I/32-33	TVOF37.....L/18	V1.5- .....A/9	VE5527 .....D/10	VP181.....K/15
TOPCS6 .....C/17	TSF- .....L/8	TVOF3M7.....L/18	V10- .....A/9	VE5527C.....D/10	VP191.....K/15
TOPCS8 .....C/17	TSKA .....A/40-41	TVSZ25.....M/3	V150.....H/18	VE5527-SZ .....D/11	VSL2- .....I/20
TP700A.....B/4	TSKC .....A/42-45	TVTR- .....K/52-53	V150-KNY.....H/18	VE55524.....D/11	VSL3- .....I/20
TP700B .....B/4	TSKCJS .....A/42-45	TVTRB- .....K/54-55	V16- .....A/9	VE58033.....D/11	VT102.....K/16
TQBY- .....M/15	TSKC-EJ .....A/42-45		V170.....H/18	VE8035.....D/10	VT106.....K/18
TR- .....F/44	TSKD .....A/37		V170-KNY .....H/18	VE8035C.....D/10	VT110.....K/16
TR1D .....I/36	TSM- .....I/35	<b>U</b>	V2.5- .....A/9	VE8035-SZ .....D/11	VT118.....K/17
TR1D .....I/38-39	TSS- .....I/34		V215.....H/18	VES10058.....D/16	VT121.....K/17
TR1E.....I/36	TSZK1- .....M/22	U03 .....C/19	V215-KNY.....H/18	VES124.....D/16	VT127 .....K/18
TR1E.....I/42-43	TSZK2- .....M/22	U05 .....C/19	V23012.....D/9	VES208.....D/16	VT145.....K/17
TR1E.....I/49	TSZL4- .....M/23	U06 .....C/19	V35.....H/18	VES3515.....D/16	VT171.....K/19
TR1K .....I/36	TSZL6- .....M/23	U08 .....C/19	V35-KNY .....H/18	VES5524.....D/16	VT181.....K/18
TR1K .....I/37	TTK- .....F/45	U09 .....C/19	V360.....H/18	VES7533.....D/16	VT191.....K/19

**W**

	ZS024S .....D/2	ZS095B .....D/2	ZS190LIL .....D/2	ZS508N .....D/2	ZSTHK .....A/17
	ZS024SZ .....D/2	ZS095FEH .....D/2	ZS190N .....D/2	ZS508P .....D/2	ZSTHP .....A/17
W45S-230/1 .....L/11	ZS024Z .....D/2	ZS095K .....D/2	ZS190P .....D/2	ZS508S .....D/2	ZSTHS .....A/17
W45S-400/4 .....L/11	ZS024ZS .....D/2	ZS095LIL .....D/2	ZS190S .....D/2	ZS508SZ .....D/2	ZSV120 .....D/3
W72-400V/4 .....L/6	ZS032 .....D/2	ZS095N .....D/2	ZS190SZ .....D/2	ZS508Z .....D/2	ZSV180 .....D/3
W96-400V/4 .....L/6	ZS032B .....D/2	ZS095P .....D/2	ZS190Z .....D/2	ZS508ZS .....D/2	ZSV240 .....D/3
WANKU00CSW201 ...G/5	ZS032FEH .....D/2	ZS095S .....D/2	ZS190ZS .....D/2	ZS63/19R .....D/4	ZSV30 .....D/3
WANKU00SW6301 ...G/5	ZS032K .....D/2	ZS095SZ .....D/2	ZS20 .....M/2	ZS75/22R .....D/4	ZSV390 .....D/3
WCJB- .....A/8	ZS032LIL .....D/2	ZS095Z .....D/2	ZS254 .....D/2	ZS760 .....D/2	ZSV48 .....D/3
WCJC- .....A/8	ZS032N .....D/2	ZS095ZS .....D/2	ZS254B .....D/2	ZS8/2R .....D/4	ZSV60 .....D/3
	ZS032P .....D/2	ZS10 .....M/2	ZS254FEH .....D/2	ZS95/30R .....D/4	ZSV90 .....D/3
	ZS032S .....D/2	ZS10-15 .....M/2	ZS254K .....D/2	ZSB130/36R .....D/4	ZSVR120 .....D/3

**Y**

	ZS032SZ .....D/2	ZS1020 .....D/2	ZS254LIL .....D/2	ZSB180/50R .....D/4	ZSVR190 .....D/3
	ZS032Z .....D/2	ZS1020P .....D/2	ZS254N .....D/2	ZSB33/8R .....D/4	ZSVR240 .....D/3
YCSK- .....A/13	ZS032ZS .....D/2	ZS1020S .....D/2	ZS254P .....D/2	ZSB51/16R .....D/4	ZSVR30 .....D/3
	ZS048 .....D/2	ZS1020SZ .....D/2	ZS254S .....D/2	ZSB85/25R .....D/4	ZSVR390 .....D/3
	ZS048B .....D/2	ZS1020Z .....D/2	ZS254SZ .....D/2	ZSBB-SET .....D/4	ZSVR48 .....D/3

**Z**

	ZS048FEH .....D/2	ZS115/34R .....D/4	ZS254Z .....D/2	ZSB-SET .....D/4	ZSVR60 .....D/3
	ZS048K .....D/2	ZS12/3R .....D/4	ZS254ZS .....D/2	ZSJR146/05 .....D/16	ZSVR90 .....D/3
Z10 .....M/2	ZS048LIL .....D/2	ZS127 .....D/2	ZS30/8R .....D/4	ZSJR146/1 .....D/16	ZSVRS- .....D/12-13
Z10-15 .....M/2	ZS048N .....D/2	ZS127B .....D/2	ZS381 .....D/2	ZSJR146/38 .....D/16	
Z20 .....M/2	ZS048P .....D/2	ZS127FEH .....D/2	ZS381B .....D/2	ZSJR180/05 .....D/16	
Z50 .....M/2	ZS048S .....D/2	ZS127K .....D/2	ZS381FEH .....D/2	ZSJR180/1 .....D/16	
ZS016 .....D/2	ZS048SZ .....D/2	ZS127LIL .....D/2	ZS381K .....D/2	ZSJR180/15 .....D/16	
ZS016FEH .....D/2	ZS048Z .....D/2	ZS127N .....D/2	ZS381LIL .....D/2	ZSJR50/05 .....D/16	
ZS016K .....D/2	ZS048ZS .....D/2	ZS127P .....D/2	ZS381N .....D/2	ZSJR50/1 .....D/16	
ZS016LIL .....D/2	ZS064 .....D/2	ZS127S .....D/2	ZS381P .....D/2	ZSJR50/15 .....D/16	
ZS016P .....D/2	ZS064B .....D/2	ZS127SZ .....D/2	ZS381S .....D/2	ZSJR75/05 .....D/16	
ZS016S .....D/2	ZS064FEH .....D/2	ZS127Z .....D/2	ZS381SZ .....D/2	ZSJR75/1 .....D/16	
ZS016SZ .....D/2	ZS064K .....D/2	ZS127ZS .....D/2	ZS381Z .....D/2	ZSJR75/22 .....D/16	
ZS016Z .....D/2	ZS064LIL .....D/2	ZS140/42R .....D/4	ZS381ZS .....D/2	ZSRSET- .....D/6-8	
ZS024 .....D/2	ZS064N .....D/2	ZS16/4R .....D/4	ZS40/12R .....D/4	ZSRSET3-1,5 .....D/5	
ZS024B .....D/2	ZS064P .....D/2	ZS175/55R .....D/4	ZS50 .....M/2	ZSRSET3-2,5 .....D/5	
ZS024FEH .....D/2	ZS064S .....D/2	ZS19/6R .....D/4	ZS50/16R .....D/4	ZSRSET4- .....D/5	
ZS024K .....D/2	ZS064SZ .....D/2	ZS190 .....D/2	ZS508 .....D/2	ZSRSET5- .....D/5-6	
ZS024LIL .....D/2	ZS064Z .....D/2	ZS190B .....D/2	ZS508B .....D/2	ZSSZ0H1,5 .....D/18	
ZS024N .....D/2	ZS064ZS .....D/2	ZS190FEH .....D/2	ZS508FEH .....D/2	ZSSZR5 .....D/18	
ZS024P .....D/2	ZS095 .....D/2	ZS190K .....D/2	ZS508K .....D/2	ZSSZVM-1 .....D/18	

# Certificate

Standard **ISO 9001:2015**

Certificate Registr. No. 01 100 1824054

Certificate Holder: **TRACON Budapest Kft.**  
Pallag utca 23.  
2120 Dunakeszi  
Hungary

Scope: wholesale of electric parts and fittings.

Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

Validity: The certificate is valid from 2018-04-20 until 2021-04-19.

2018-04-20



TÜV Rheinland Cert GmbH  
Am Grauen Stein · 51105 Köln

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