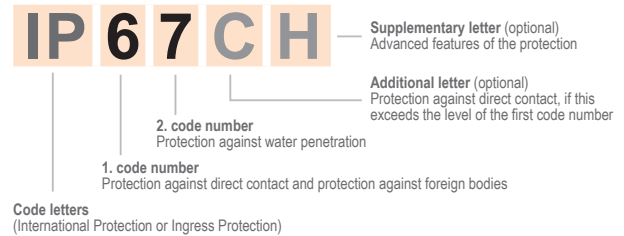










IP-Code for the protection of persons and equipment by enclosures

Protection types are divided into IP codes. IP stands for International Protection or Ingress Protection.

The type of protection is to be distinguished from the protection class: Protection classes designate the degree of protection of an enclosure against contact, foreign bodies, water.





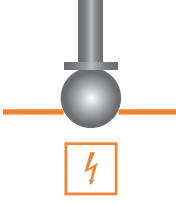


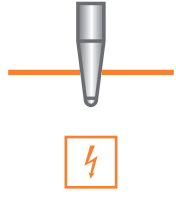


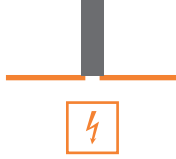


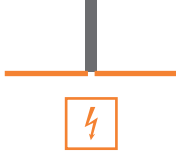

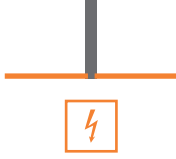

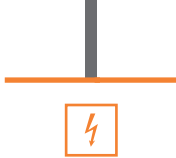
Protection classes according to DIN EN 60529 resp. VDE 0470, part 1

1. number	Mechanical strength		Graphic symbol	2. number	Water protection	Graphic symbol
	Contact protection	Foreign body protection				
IP 0X	No special protection	No special protection	-	IP X0	No special protection	-
IP 1X	Protection against large-area contact (back of the hand)	Protection against penetration of solid foreign bodies with a diameter ≥ 50 mm	-	IP X1	Protection against vertically dripping water	drip-proof IP X1 
IP 2X	Protection against touch with one finger	Protection against penetration of solid foreign bodies with a diameter ≥ 12.5 mm	-	IP X2	Protection against vertically dripping water, operating equipment tilted up to 15°.	-
IP 3X	Protection against contact with tools, wires or similar. ≥ 2.5 mm \varnothing	Protection against penetration of solid foreign bodies with a diameter ≥ 2.5 mm	-	IP X3	Protection against water spray (rain) up to an angle of 60° from the vertical	spray water-protected (rain protected) IP X3 
IP 4X	Protection against contact with tools, wires or similar ≥ 1 mm \varnothing	Protection against penetration of solid foreign bodies with a diameter ≥ 1 mm	-	IP X4	Protection against splashing water from all directions	spray water-protected IP X4 
IP 5X	Protection against contact with tools, wires or similar ≥ 1 mm \varnothing	Protection against dust deposits (dust protected) Complete protection against contact	dust protected IP 5X 	IP X5	Protection against water jets (nozzle) from all directions	jet water-protected IP X5 
IP 6X	Protection against contact with tools, wires or similar ≥ 1 mm \varnothing	Protection against dust penetration (dust-tight) Complete protection against contact	dust-tight IP 6X 	IP X6	Protection against strong water jet or heavy sea	-
If only one code number for the degree of protection is required in addition to the code letters IP, an „X“ must be entered in place of the missing code number, e.g. IP X4 or IP 3X.				IP X7	Protection against water in case of immersion of the equipment under pressure, time conditions	water-proof IP X7 
				IP X8	Protection against water in case of permanent immersion of the equipment	pressurized water-tight IP X8  ...bar

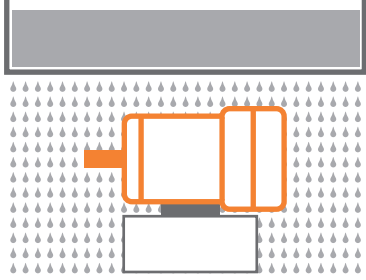
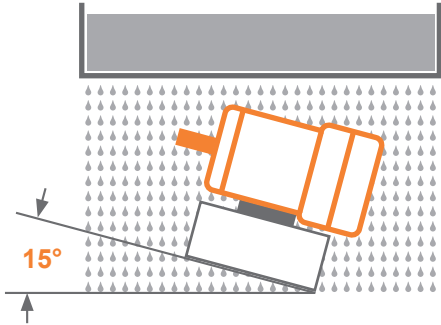

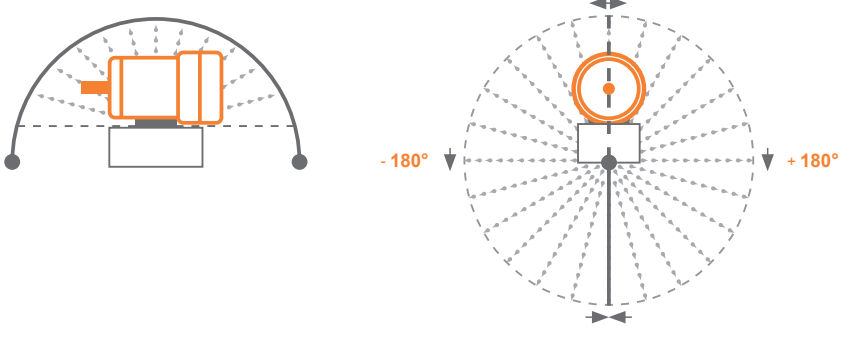
IP designation by trailing letters:

Additional letter (optional)		Supplementary letter (optional)	
A	Protection against access with the back of the hand	H	Operating equipment for high voltage
B	Protection against access with the finger	M	Tested for water ingress while machine is running
C	Protected against access with tools	S	Tested for water ingress when machine is stationary
D	Protected against access with wire	W	Suitable for specified weather conditions

First code number

Protection against solid objects and access				
1. number	Protection of equipment against ingress of solid foreign objects		Protection of persons against access to hazardous parts	
IP 1X	\emptyset $\geq 50 \text{ mm}$		Back of hand 	
IP 2X	\emptyset $\geq 12,5 \text{ mm}$		Finger 	
IP 3X	\emptyset $\geq 2,5 \text{ mm}$		Tool 	
IP 4X	\emptyset $\geq 1,0 \text{ mm}$		Wire 	
IP 5X	dust-protected			
IP 6X	dust-tight			


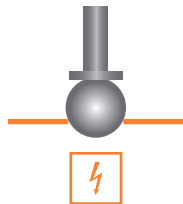
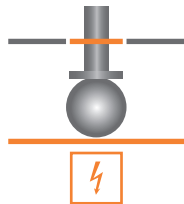

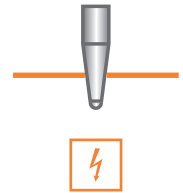
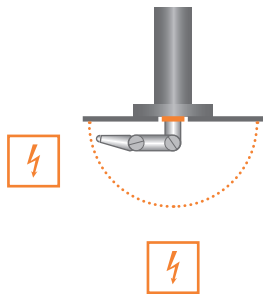

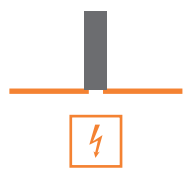
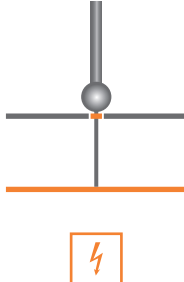

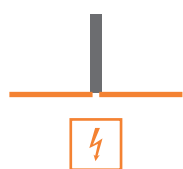
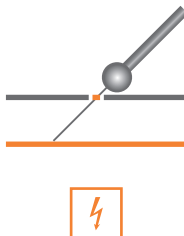
Second code number

Protection against water		
2. number	Protection against	Principle of test
IP X1	Dripping water	
IP X2	Dripping water at 15° tilt	
IP X3	Spraying water (rain) up to an angle of 60° to the vertical	
IP X4	Splashing water from all directions	

Second code number

Protection against water		
2. number	Protection against	Principle of test
IP X5	Water jets from all directions	<p> $qv = 12,5 \text{ l/min}$ $p \sim 0,3 \text{ bar}$ $t = 1 \text{ min/m}^2$ $> 3 \text{ min}$ </p>
IP X6	Powerful water jets or heavy sea	<p> $qv = 100 \text{ l/min}$ $p \sim 1 \text{ bar}$ $t = 1 \text{ min/m}^2$ $> 3 \text{ min}$ </p>
IP X7	Effects of temporary immersion in water of the operating equipment under pressure, time conditions	<p> $< 150 \text{ mm}$ $< 1000 \text{ m}$ $t = 30 \text{ min}$ </p>
IP X8	Effects of continous immersion in water of the equipment	<p> $>> 150 \text{ mm}$ $>> 1000 \text{ mm}$ $t = \infty$ $IPX8 > IPX7$ </p>

IP marking by additional letter

Comparison between first code number and additional letter				
Protection of persons against access to hazardous parts with	First code number (Protection by limitation of opening widths)		Additional letter (Protection by distance or barriers)	
	Degree of protection	Test	Degree of protection	Test
Back of hand 	IP 1X Sphere \varnothing 50 mm		IP XXA Sphere \varnothing 50 mm	
Finger 	IP 2X Sphere \varnothing 12,5 mm		IP XXB Jointed finger \varnothing 12,5 mm	
Tool 	IP 3X Rod \varnothing 2,5 mm		IP XXC Rod \varnothing 2,5 mm Length: 100 mm	
Wire 	IP 4X Wire \varnothing 1,0 mm		IP XXD Wire \varnothing 1,0 mm Length: 100 mm	

Product overview - First code number





„Protection of persons against access to dangerous parts“.								
Article no.	Image	Description	IP 1X	IP 2X	IP 3X	IP 4X	IP 5X	IP 6X
MP-100.04F		Access probe (back of Hand) Ø 50 mm with sufficient distance from the dangerous parts	●					
MP-P10.14		IEC-Joint finger probe Ø 12 mm, Length: 80 mm with sufficient distance from the dangerous parts		●				
MP-100.04G		Access and objekt probe Metal test rod Ø 2.5 mm must not penetrate			●			
MP-100.04J		Access and objekt probe Metal test rod Ø 1 mm must not penetrate				●	●	●

„Protection of equipment against the ingress of solid foreign bodies“.								
Article no.	Image	Description	IP 1X	IP 2X	IP 3X	IP 4X	IP 5X	IP 6X
MP-100.04H		Test sphere Ø 50 mm must not penetrate, 50 N	●					
MP-100.04K		Test sphere Ø 12,5 mm must not penetrate, 30 N		●				
MP-100.04G		Access and objekt probe Metal test rod Ø 2.5 mm must not penetrate, 3 N			●			
MP-100.04J		Access and objekt probe Metal test rod Ø 1 mm must not penetrate, 1 N				●		

Product overview - Second code number

„Water Protection“								
Article no.	Image	Description	IP X1	IP X2	IP X3	IP X4	IP X5	IP X6
MP-P03.26		Jet nozzle set 12,5 l/min, Ø 6,3 mm, Protection against water jets					●	
MP-P03.28		Jet nozzle set 100 l/min, Ø 12,5 mm, Protection against strong water jets						●
MP-P05.24		Spray nozzle 10 l/min, Protection against spray and splash water			●	●		

Product overview - additional letter

„Protection of persons against access to dangerous parts“.						
Article no.	Image	Description	IP xxA	IP xxB	IP xxC	IP xxD
MP-100.04F		Access probe (back of Hand) Ø 50 mm with sufficient distance from the dangerous parts	●			
MP-P10.14		IEC-Joint finger probe Ø 12 mm, Length: 80 mm with sufficient distance from the dangerous parts		●		
MP-100.04G		Access and objekt probe Metal test rod Ø 2.5 mm must not penetrate			●	
MP-100.04J		Access and objekt probe Metal test rod Ø 1 mm must not penetrate				●