

STAR - DELTA STARTERS - TYPE SDS

Star - delta starters are used for starting three-phase induction cage motors which are not overloaded during the starting. When starting, the windings of the stator are connected to the mains in a position of a start. After the starting operation they assume a delta position. Due to this change of the position of the windings the value of the starting current of the motor is 0,58 of the current of direct starting in delta position of the windings. When starting the motor in this way the starting moment is three times shorter, so this starters can only be used for motors whose starting moment, due to lack of overloading, is much shorter, and for those starting in idle or under light load. The windings can change their start position into a delta position after the motor achieves a nominal numbers of rotations. Motors which require an early change of the position of the windings cannot be started with SDS type of starters.

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In table 1. quoted currents and capacities are valid only if special star-delta timer EVRK 40 is used.

The change of the windings from star position to delta position occurs automatically after the starting operations is over. The starting can be adjusted to last from 2-20 s with a switch delay of about 100ms by means of an embedded timer.

The thermal overload relay can operate accurately during permanent duty if the number of starts per hour does not exceed 15, and during intermittent duty (with 40% working time) if the number of starts per hour does not exceed 60.

Overload protection

The thermal overload relay is set to cca 0,58 x motor rated current.

Technical data for current range of thermal overload relays are given in table 2.

Table 1 - Technical data for Star - Delta starters


	Star-Delta starter type SDS	In at 400 V	Max. motor output at 50 Hz and			
		A	220 V	400 V	500 V	690 V
			kW	kW	kW	kW
	SDS 7,5	16	4	7,5	7,5	10
	SDS 11	22	5,5	11	11	15
	SDS 15	29	7,5	15	15	18,5
	SDS 18,5	37	11	18,5	22	22
	SDS 22	44	15	22	25	34
	SDS 25	50	15	25	25	34
	SDS 30	60	15	30	30	37

Table 2 - Current range of thermal overload relays and selection of components for SDS

Type of starter	Pn kW	K1	K2	K3	EVR	TM	Range A	I _r A
SDS 7,5	7,5	CNN 9	CNN 9	CNN 9	EVR 40	TM 40	6,3-10	9
SDS 11	11	CNN 12	CNN 12	CNN 9	EVR 40	TM 40	10-16	12,7
SDS 15	15	CNN 18	CNN 18	CNN 12	EVR 40	TM 40	12,5-20	16,8
SDS 18,5	18,5	CNN 25	CNN 25	CNN 25	EVR 40	TM 40	16-25	20,3
SDS 22	22	CNN 30	CNN 30	CNN 25	EVR 40	TM 40	16-25	23,7
SDS 25	25	CNN 32	CNN 32	CNN 32	EVR 40	TM 40	22-30	29
SDS 30	30	CNN 40	CNN 40	CNN 32	EVR 40	TM 40	28-38	31,9

ORDER:

Example: Motorstarter type SDS 18,5 control voltage 220/230 V, 50 Hz


SDS 18,5 **220/230 V** **50 Hz.**

Example: Star - Delta Starters type SDS 18,5 control voltage 220/230 V, 50 Hz, thermal overload relay type TM 40, current range (10-16)A

SDS 18,5 **220/230V** **50 Hz** **16A**

STAR - DELTA STARTERS IN ENCLOSURES - TYPE PNSDS

Table 1 - Technical data for Star - Delta starters

	Star-Delta starter type PNSDS	In at 400 V A	220 V kW	400 V kW	500 V kW	690 V kW	Dimensions (axbxc) mm
	PNSDS 7,5	16	4	7,5	7,5	7,5	210x260x185
	PNSDS 11	22	5,5	11	11	7,5	
	PNSDS 15	29	7,5	15	15		
	PNSDS 18,5	37	11	18,5	22	15	240x320x205
	PNSDS 22	44	15	22	22	15	
	PNSDS 25	50	15	25	25	18,5	
	PNSDS 30	55	18,5	30	30	25	400x500x207
	PNSDS 37	72	22	37	37	37	
	PNSDS 45	85	26	45	45	45	
PNSDS 55	105	37	55	55	55	400x600x217	

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Table 2 - Current range of thermal overload relays and selection of components for PNSDS

Type of starter	Pn kW	K1	K2	K3	EVR	TM	Range A	I _r A	Max. starting time from cold state*
PNSDS 7,5	7,5	CNN 9	CNN 9	CNN 9	EVRK 40	TM 40	6,3-10	9	15
PNSDS 11	11	CNN 12	CNN 12	CNN 9	EVRK 40	TM 40	10-16	12,7	
PNSDS 15	15	CNN 18	CNN 18	CNN 12	EVRK 40	TM 40	12,5-20	16,8	
PNSDS 18,5	18,5	CNN 25	CNN 25	CNN 25	EVRK 40	TM 40	16-25	20,3	
PNSDS 22	22	CNN 30	CNN 30	CNN 25	EVRK 40	TM 40	16-25	23,7	
PNSDS 25	25	CNN 32	CNN 32	CNN 32	EVRK 40	TM 40	22-30	29	
PNSDS 30	30	CNN 40	CNN 40	CNN 32	EVRK 40	TM 40	28-38	31,9	30
PNSDS 37	37	CNN 50	CNN 50	CNN 32	EVRK 40	TRM 75-N60	32-50	41,6	
PNSDS 45	45	CNN 60	CNN 60	CNN 40	EVRK 40	TRM 75-N60	40-57	49	
PNSDS 55	55	CNN 70	CNN 70	CNN 40	EVRK 40	TRM 75-N60	50-63	61	

(*) Usual time value = 6.....10 s.

ORDER:

Example: Motorstarter type PNSDS 18,5 control voltage 220/230 V, 50 Hz

PNSDS 18,5 **220/230 V** **50 Hz.**

Example: Star - Delta Starters type SDS 18,5 control voltage 220/230 V, 50 Hz, thermal overload relay type TM 40, current range (10-16)A

PNSDS 18,5 **230/230** **50 Hz** **16A**