

# KAKKU HEAVY DUTY CAM OPERATED ROTARY GEARED LIMIT SWITCHES

## SERIES KTLS – 4000

### SPECIAL FEATURES

- Double break snap acting contacts with high quality silver cadmium oxide contact tips having arc-retarding and anti-welding properties.
- Provided with specially treated oil resistant rubber gaskets at all the joints to make the switch completely dust proof.
- Contact arms, Latching mechanism and cams of high grade phenolic fibrous moulded material having excellent electrical & mechanical properties.
- Universal design for both AC and DC applications.
- Resists extreme shock and vibratory conditions.
- Long life with ease of maintenance, reliability of performance & flexible contact sequence.

### APPLICATION

KAKKU Heavy Duty Cam Operated Rotary Geared Limit Switches Series KTLS – 4000 are available in a variety of different sizes & designs. The contact system of these limit switches is actuated by a rotating shaft with programmable cams. This shaft is geared or directly coupled to the drive. Thus the motion of the mechanism is translated into rotation of the switch shaft. These limit switches are used as precise position switches for automatic control of reversible or non – reversible electric drives in cranes, hoists, winches, transfer cars, pushers and other material handling equipments.

### CONSTRUCTIONAL & OPERATIONAL FEATURES

The limit switch comprises of a drum shaft a moving contact rack and a fixed contact plate. The drum shaft is fitted with a number of cam segments which equals the number of contacts in the switch. If the number of contacts exceeds six the switches are fitted with two

drum shafts, which operate equal number of contacts. In such cases either both the drum shafts rotate simultaneously or alternatively in turns. The limit switches should be so adjusted that the speed of the drum shaft does not exceed 30 rpm.

The cam segments and the operating cams are so designed that it is possible to open and close the contacts at any desired angle. When contact closing cam strikes the moving contact element the contacts get latched in closed position until the contact opening cam releases the latch. The contacts open with snap action.

A maximum number of three opening and closing cams can be mounted on each segment. The distinguishing features of these limit switches are given in the selection chart.

### TECHNICAL DATA

Ambient temperature	: 55°C.
Mounting arrangement	: Foot mounted.
Housing	: Cast Iron/ Cast Aluminium with sheet steel cover.
Enclosure category	: As per IP-54 of IS : 2147-1962.
Shaft extension	: Single or double in series KTLS-4600
Torque on shaft	: 5Nm for making and 4Nm for breaking a contact.
Terminals	: Suitable for conductor size 2.5mm <sup>2</sup> .

### OPTIONAL EXTRAS

- Enclosure category IP – 55 or superior.
- Gear ratio other than that specified.
- Epoxy paint for special applications.
- Reducer can provided at cable entry for 25mm of 19mm conduit.

### RATINGS

Rated Operational Voltage	Rated Operational Current with short Time Loading upto 75A for 10 sec. max.	Breaking Current at Inductive Load (Amps.)			
		DC L/ R ≤ 0.01 sec.			Upto 500V AC cosΦ ≥ 0.4
		110V	220V	440V	
Upto 500V, 50Hz AC or 440V DC	25 Continuous	2.5	2.0	0.5	25

### SELECTION CHARTS

1. Vertical configuration fastened to horizontal base with reduction gear, single shaft or double shaft extension. (See fig.1)

Selection Chart According to No. of Contacts.		Selection Chart According to Gear Ratios and No. of Extended Shafts.		
Basic Types	No. of Contacts	Gear Ratio	Code	
			Single Shaft	Double Shaft
KTLS – 4628	2	1 : 1	1	21
KTLS – 4648	4	1 : 15	3	23
KTLS – 4658	5	1 : 30	5	25
KTLS – 4668	6	1 : 5	6	26

Reference of KAKKU types and erst-while USSR types			
KAKKU type	USSR type	KAKKU type	USSR type
KTLS-4628-1	KA-4628-1T	KTLS-4628-21	KA-4628-21T
KTLS-4628-3	KA-4628-3T	KTLS-4628-23	KA-4628-23T
KTLS-4628-5	KA-4628-5T	KTLS-4628-25	KA-4628-25T
KTLS-4628-6	KA-4628-6T	KTLS-4628-26	KA-4628-26T
KTLS-4658-1	KA-4658-1T	KTLS-4658-21	KA-4658-21T
KTLS-4658-3	KA-4658-3T	KTLS-4658-23	KA-4658-23T
KTLS-4658-5	KA-4658-5T	KTLS-4658-25	KA-4658-25T
KTLS-4658-6	KA-4658-6T	KTLS-4658-26	KA-4658-26T

### EXAMPLE FOR SELECTION

For limit switch having 5 contacts with single shaft extension, gear ratio 1: 5, the type is KTLS-4658-6 & that for double shaft extension the type is KTLS-4658-26.



Symbol Of Reliability

2. Horizontal configuration, foot mounted, single shaft extension with reduction gear, having two drum shafts. (See fig.2)

Basic types	No. of contacts	Engagement of drum shaft	Gear ratio *	Eqvt to erst-while USSR type
KTLS - 4148 - 4	8	SIMULTANEOUSLY	1 : 1, 1 : 2, 1 : 20, 1 : 36	KA - 4148 - 4T
KTLS - 4168 - 4	16	SIMULTANEOUSLY	1 : 1, 1 : 2, 1 : 20, 1 : 36	KA - 4168 - 4T
KTLS - 4188 - 4	24	SIMULTANEOUSLY	1 : 1, 1 : 2, 1 : 20, 1 : 36	KA - 4188 - 4T
KTLS - 4148 - 4	8	IN - TURN	1 : 1, 1 : 16.65	KA - 4148 - 3T
KTLS - 4168 - 4	16	IN - TURN	1 : 1, 1 : 16.65	KA - 4168 - 3T
KTLS - 4188 - 4	24	IN - TURN	1 : 1, 1 : 16.65	KA - 4188 - 3T

\* Any one gear ratio can be selected.

3. Horizontal configuration, foot mounted, single shaft extension, without reduction gear. (See fig.3)

Basic types	No. of contacts	Eqvt. to erst-while USSR types
KTLS - 4024	2	KA - 4024T
KTLS - 4044	4	KA - 4044T
KTLS - 4064	6	KA - 4064T

#### DIMENSIONS

As per relevant figures shown in the dimensional data sheet.

#### ORDERING INFORMATION

- Give KAKKU type and gear ratio where ever applicable.
- Contact opening & closing sequence for each of the contacts.
- Specify optional extras if any.

SERIES KTLS - 4000  
Dimensions (mm)

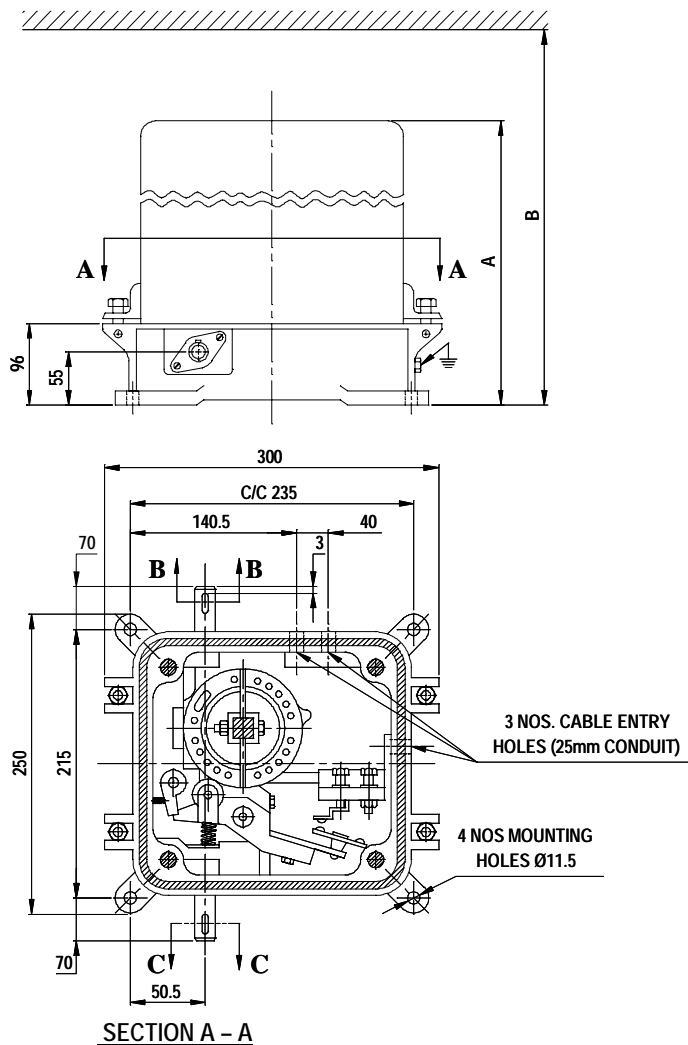
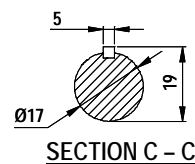
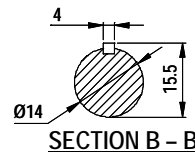


Fig. 1 : CAM OPERATED ROTARY GEARED SWITCH

Basic Type	No. of Contacts	A	B
KTLS - 4628	2	294	655
KTLS - 4648	4	386	745
KTLS - 4658	5	447	805
KTLS - 4668	6	506	865



#### NOTE :

For switches with single shaft extension; shaft Ø14 is dispensed with.

*Product improvement is a continuous process at KAKKU. Hence data given in this catalogue is subject to revision without notice.*



Symbol Of Reliability

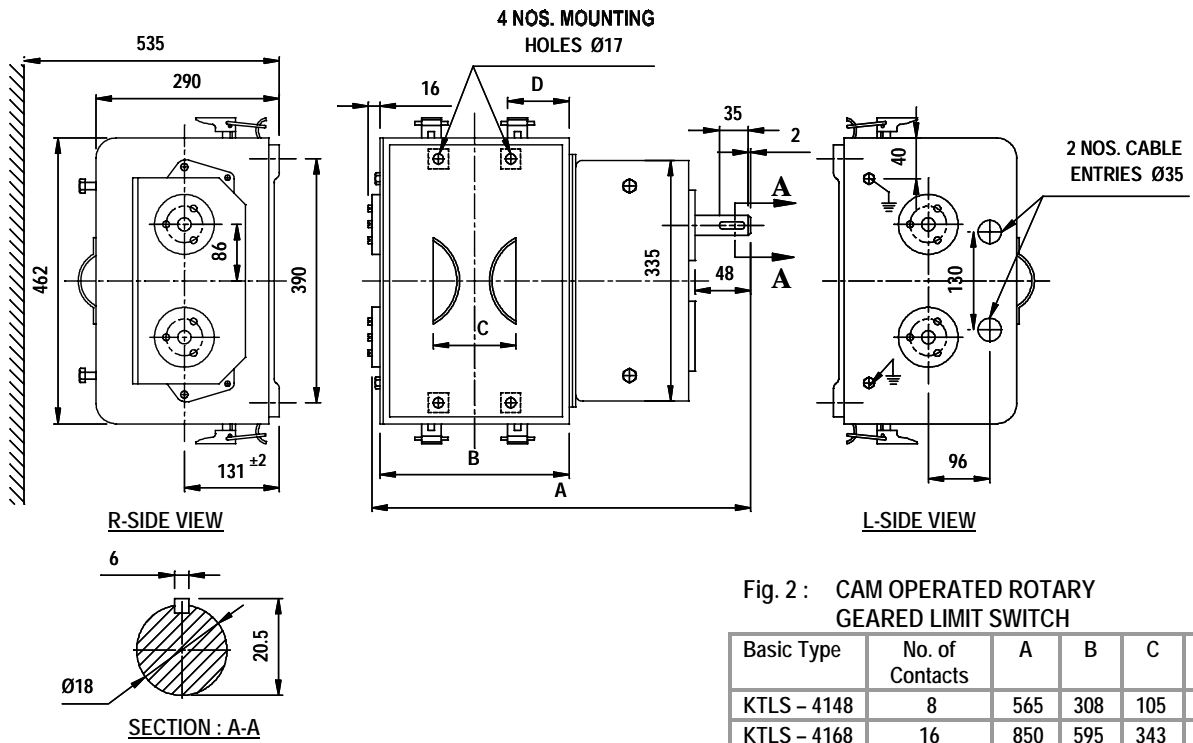


Fig. 2 : CAM OPERATED ROTARY GEARED LIMIT SWITCH

Basic Type	No. of Contacts	A	B	C	D
KTLS - 4148	8	565	308	105	92
KTLS - 4168	16	850	595	343	116
KTLS - 4188	24	1054	800	520	116

Shaft extn. can also be provided on the left side (view for shaft end)

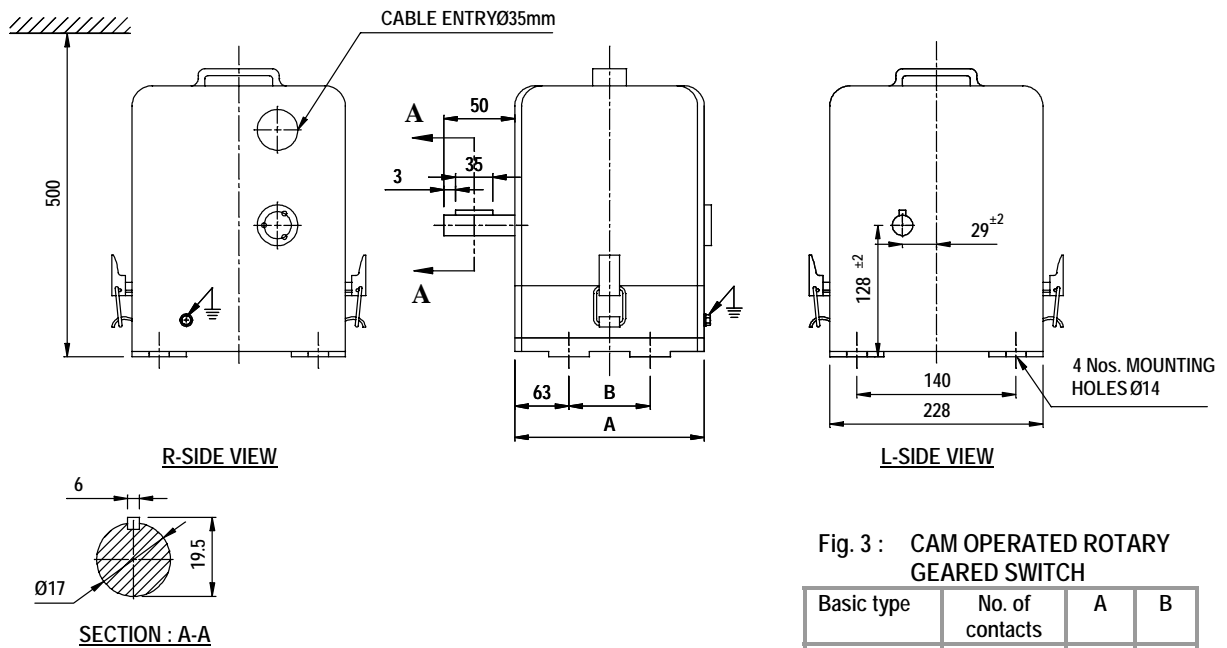


Fig. 3 : CAM OPERATED ROTARY GEARED SWITCH

Basic type	No. of contacts	A	B
KTLS - 4024	2	210	80
KTLS - 4044	4	312	182
KTLS - 4064	6	414	284