

DL66 HEAVY DUTY LINEAR ACTUATOR (Models "E", "F" & "G")

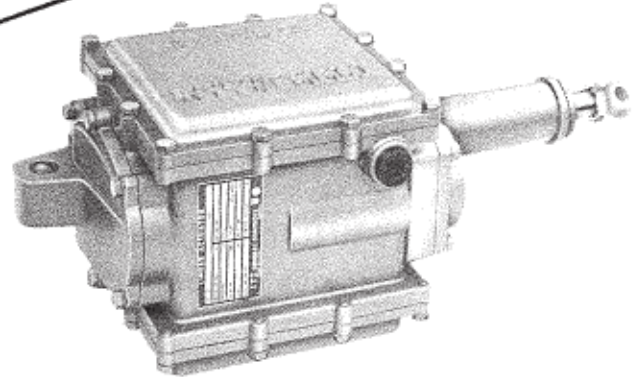
INSTALLATION AND SERVICE

DESCRIPTION

DL 66 Actuator is a heavy duty gear driven unit powered by an integral, reversible, capacitor type motor. DL-66 is used for converting manually operated valves or equipment to remote and/or automatic operation. Typical applications include actuation of plug, ball and butterfly valves; operation of gates and doors; positioning of heavy dampers, etc., where travel and thrust requirements are within capabilities of actuator. (See table).

All models are equipped with electric brake, fully adjustable travel limit switches and ball race screw drive.

Optional features include auxiliary switches, position transmitting potentiometer, protective boot for ram, manual override device, non standard hardware. DL-66 can be mounted in any position. Mounting hardware is available on order in accessory kits; Kit AC6A for saddle yoke mounting; Kit AC6B for bracket mounting; Kit AC6C for vertical or direct valve yoke mounting. Mounting instructions are furnished with Accessory Kits.



Catalog Number	Nominal Timing — Seconds*	Maximum Thrust Lbs.①	Rated Torque — Inch-Lbs.②	VA @ Rated Speed	Max. Stroke Inches.
DL66C262	12	800	2240	205	6
DL66C362	30	1200	3360	185	
DL66C462	60	1200	3360	185	
DL66C562	120	1200	3360	115	
DL66D292	12	600	3570	240	12
DL66D362	30	800	4760	205	
DL66D462	60	1200	7140	185	
DL66D562	120	1200	7140	185	
DL66E792	22	600	—	240	18

*50 cycle service increases ram travel time by 20%

①Thrust shown is for rated timings tabled. Intermittent duty stall ratings are at least 50% higher.

②Inch-pounds torque rating applies only to applications using a 90° of valve rotation and a valve stem clamp.

OPERATION

Power to terminals 3 and 4 drives unit to "extend" and power to terminals 4 and 5 drives to "retract". Shaft may be stopped, reversed, or inched at any position of travel. Gearing rotates screw to drive the ball bearing traveling nut which positions the actuator shaft. Adjustable cams for operating limit switches are gear driven from the screw drive. Brake instantaneously stops and positively locks actuator shaft. Brake is released when motor is powered. If ram travel extends or retracts beyond units safe operating range, safety switch will put unit out of operation. See section "SAFETY SWITCH RESET."

INSTALLATION

Actuator may be mounted in any position. Consider accessibility to cover plates and position of drain on explosion proof-weatherproof model. Select location to impart desired motion within travel and thrust limitations of specific model. See Instruction Sheet furnished with Accessory Kit mounting hardware for mounting details.

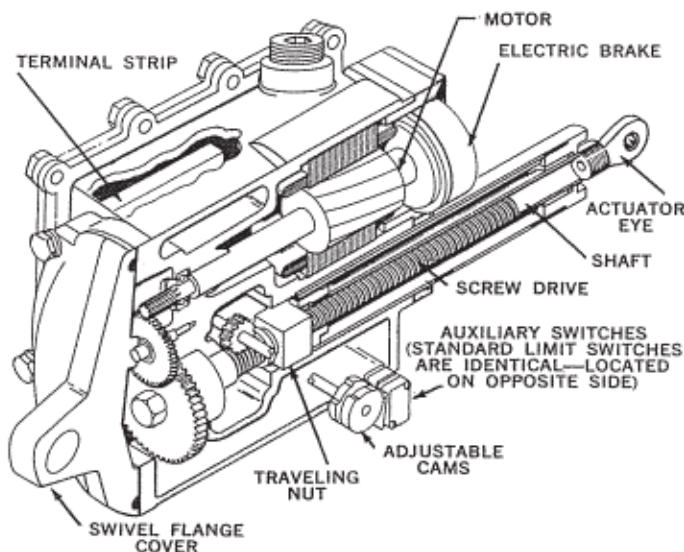


Fig. 1. Interior of Typical DL66



WIRING

All wiring must be in accordance with applicable codes. Switches and wiring capable of handling 5A at 120 VAC will be adequate. When actuator mounting requires movement, as with saddle yoke mount, a length of flexible conduit must be used.

Internal wiring and typical external wiring is shown in Figs. 2, 3a & 3b. Terminal strip shown is the "POWER" strip.

Fig. 4 indicates all optional variations which may be included on order. Potentiometers and/or auxiliary switches when specified are connected to the designated terminals. Terminal strip shown is the "AUXILIARY" strip.

CAUTION

No auxiliary loads can be connected without proper electrical isolation. This isolation must prevent any feedback or loading effect upon any portion of internal circuitry when in normal operation.

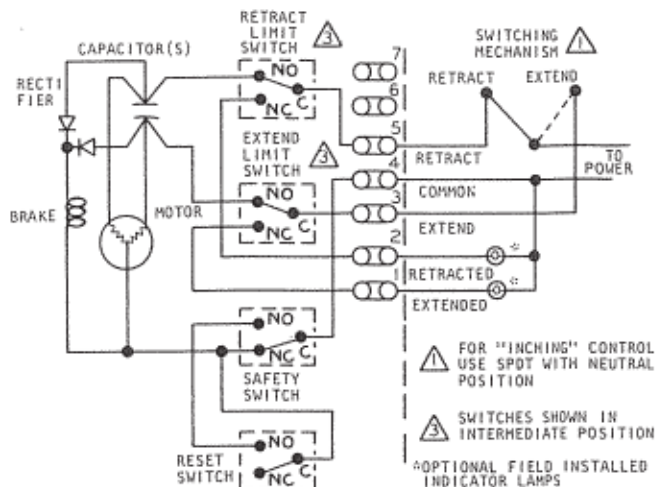


Fig. 2. Internal and Typical External Wiring for Single Phase Model.

DL66 — 120V, 60 HZ, 1 ϕ & 240V, 60 HZ, 1 ϕ

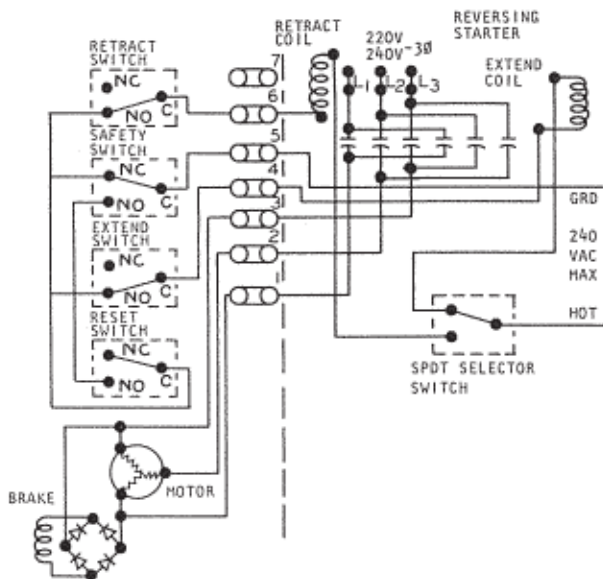


Fig. 3a. Internal and Typical External Wiring for Three-Phase Model using Magnetic Reversing Contactor.

DL66 — 220V, 60 HZ, 3 ϕ & 240V, 60 HZ, 3 ϕ

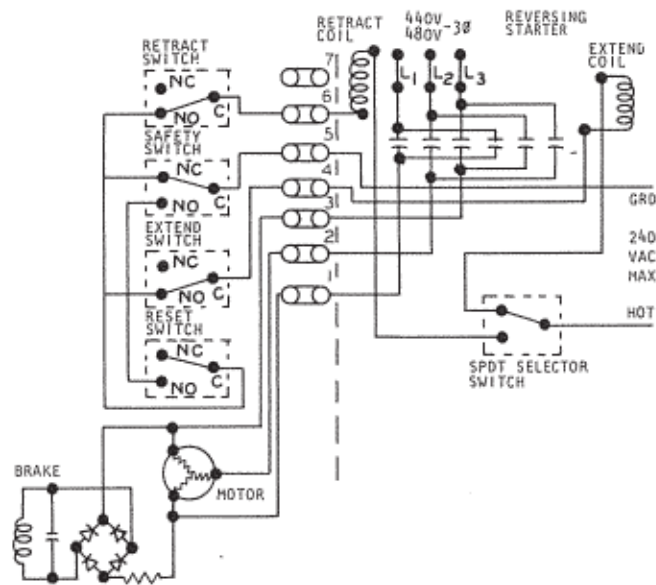


Fig. 3b. Internal and Typical External Wiring for Three-Phase Model using Magnetic Reversing Contactor.

DL66 — 440V, 60 HZ, 3 ϕ & 480V, 60 HZ, 3 ϕ

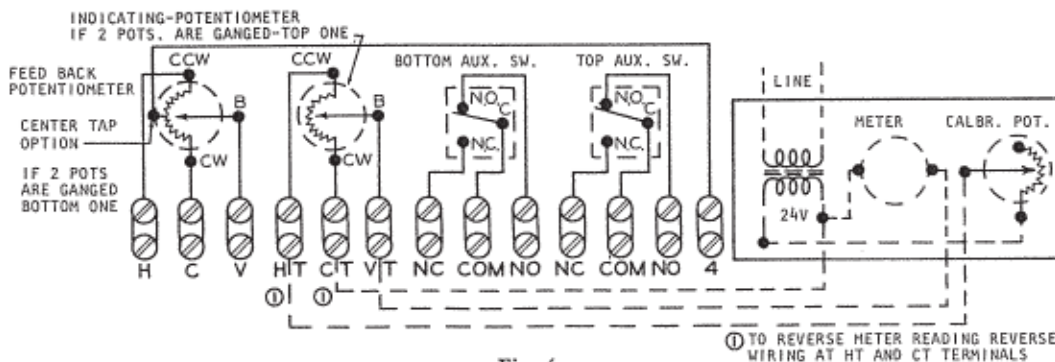


Fig. 4.

Internal Wiring of optional items connected to Auxiliary Terminal Strip. Dotted lines show indicating potentiometer wiring and meter with calibrating potentiometer.

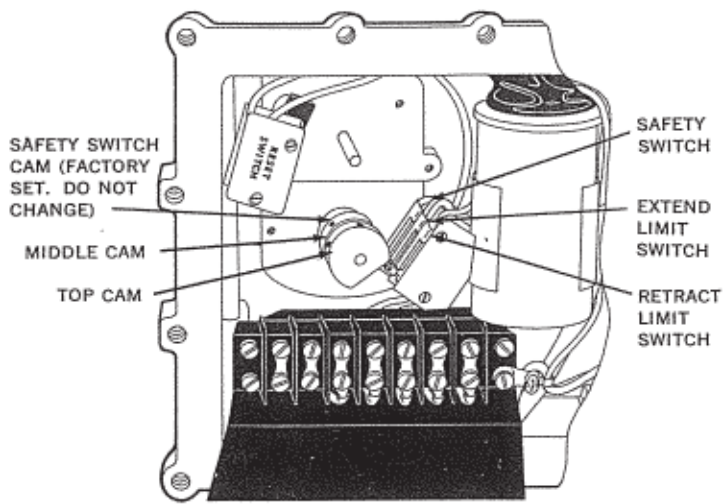
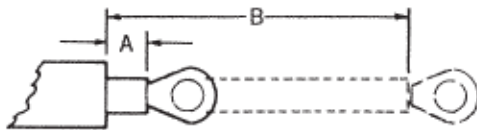


Fig. 5. Limit Switches Shown

TRAVEL LIMIT SWITCH ADJUSTMENT

CAUTION

When adjusting retract limit switch dimension, 'A' must not be less than 1-3/16". When adjusting extend limit switch dimension, 'B' must not be more than 7-3/16" for 6" travel model, 13-3/16" for 12" travel model or 19-3/16" for 18" travel model.



The two (retract and extend) travel limit switches are located in the same compartment as the power terminals. Two cams are mounted on a shaft driven by a worm gear on shaft screw drive. Each cam is locked on the shaft by two Allen head set screws. The top cam and switch, nearest the cover, control the "retract" position. The middle cam and switch control the "extend" position. Both cams turn counter-clockwise as the actuator shaft retracts and clockwise as shaft extends. Actuator motor stops as roller on switch drops into detent of cam.

Actuators are shipped from factory with extend and retract cams adjusted for full shaft travel (6" to 18" depending on model). If actuator is installed in either fully retracted or fully extended position, only one cam need be adjusted. When auxiliary potentiometers are used, maximum ram travel must be used.

WARNING

Terminal Board and Switch Terminals are at line voltage potential. Disconnect power from actuator while adjusting cams.

CAUTION

Person making cam adjustment should have complete and immediate control of power to actuator during adjustment. If this is not possible, remove pin through eye and operate valve or mechanism manually and actuator electrically. Damage may result if actuator drives against any mechanical stop.

1. Carefully determine proper cam to be adjusted—middle for "extend" position, top for "retract" position.
2. Operate actuator electrically to desired position. Stop actuator by removing power.
3. Turn off power. To set extend position, loosen two Allen head set screws on middle cam and rotate cam clockwise until roller just drops into detent. To set retract position, loosen two Allen head set screws on top cam and rotate cam counter-clockwise until roller just drops into detent.
4. Hold cam at roller height and snug set screws lightly. Operate unit electrically without pin to check adjustment. Be sure shaft stops before linkage will hit any mechanical stop.
5. Tighten cam set screws securely. Connect actuator shaft eye to load. Secure pin with cotter pin.

SAFETY SWITCH RESET

The Safety Switch is factory set to stop ram travel in case of limit switch damage or improper setting of limit cams. DO NOT CHANGE SAFETY SWITCH CAM SETTING. REPLACE OR RESET LIMIT SWITCH SO RAM STOPS BEFORE ACTUATING SAFETY SWITCH.

If ram retracts or extends more than dimension A or B unit will shut down on Safety Switch. It must be reset manually. Proceed as follows:

1. If ram is in extended position power terminals 4 and 5 to retract ram. If ram is in retracted position power terminals 3 and 4 to extend ram.
2. Press Reset Switch (See Fig. 5) with finger, hold momentarily until unit actuates. Remove power from 3 and 4 or 4 and 5 when ram is at mid-point.
3. Replace faulty limit switch or adjust limit switch cam for proper operation.

AUXILIARY SWITCHES

Auxiliary switches, when specified on order, are located in the compartment opposite from the power terminal compartment. Switch or switches are cam operated. Adjust in same manner as travel limit switches.



LUBRICATION

The Actuator is permanently lubricated at the factory and need seldom be relubricated. However, in the event relubrication becomes necessary, proceed as follows:

TUBE AND NUT LUBRICATION (SEE FIG. 1): (1) Power Actuator to full extent. (2) Remove Actuator eye. (3) Remove 4 screws holding outer tube assembly. (4) Do not turn tube. Pull straight off inner thrust tube. (5) Hold inner thrust tube so it does not turn. Lubricate moving surfaces and rail lightly with MOLUB-ALLOY #577 or equal. (6) Replace outer tube assembly without changing position of traveling nut. Check actuator through a number of normal operations. Adjust travel limit switches if necessary.

GEAR LUBRICATION (See FIG. 1): (1) Remove swivel flange cover. (2) Brush thin film of MOLUB-ALLOY #577 or equal on meshing gear surfaces. (3) Replace O-ring and swivel flange cover and tighten screws.

REMOTE POTENTIOMETER (H6, H7 OPTIONS); Adjustment and Calibration — See Fig. 4 for Hookup

1. After travel limit cams have been adjusted the meter will not read accurately at either 'extend' or 'retract' position if both cams have been repositioned.

NOTE

If only one cam has been adjusted the calibrating potentiometer may be turned until meter zeros at either unadjusted cam position. In the 'retract' position the meter will zero when wired according to wiring diagram. If unadjusted cam is 'retract' cam and you wish to read from zero to 100% as the unit is retracting, interchange meter wiring at terminals HT & VT. See Fig. 4.

2. If both 'extend' and 'retract' cams have been changed so that desired shaft travel is in the middle of factory adjusted full stroke, it will be necessary to perform the following steps:
 - A. With unit in selected 'retract' position loosen the two set screws under actuator mounted indicating potentiometer. Remove 4 screws holding pot bracket.

NOTE

Lift potentiometer and bracket straight up and off from connecting collar without turning bracket or potentiometer.

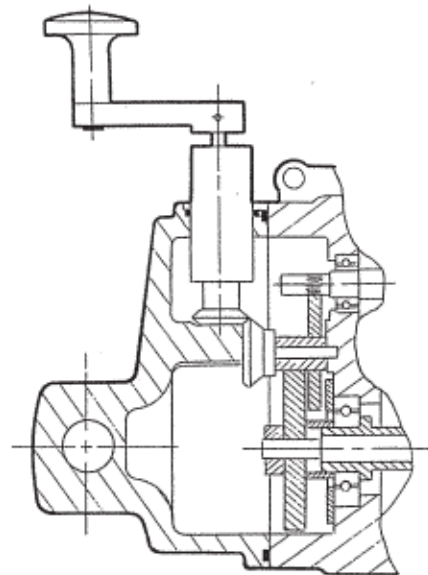
- B. Watch meter carefully while doing this. Meter needle should not change from its original position.

- C. Holding potentiometer bracket, turn potentiometer shaft slowly until meter needle just reads zero. If meter jumps to a higher range, turn potentiometer shaft CW and CCW until it just zeros.
- D. Align holes in potentiometer bracket with four holes in actuator mounting plate. With care push potentiometer shaft and bracket down into position. Watch meter for movement during this reinstallation as meter needle should not move. Insert and tighten four screws in bracket.
- E. Carefully tighten alternately and evenly both set screws in collar.
- F. Apply power to unit to 'extend' terminals 4 and 3. As unit is extending adjust calibrating potentiometer so meter needle does not travel beyond 100%. When unit stops in 'extend' position, adjust calibrating potentiometer to indicate 100%. Run unit through a number of 'extend' and 'retract' cycles to make sure meter needle progresses slowly from zero at 'retract' to 100% at 'extend' position. If it is required to show zero at 'extend' position and 100% at 'retract' position, switch wires at HT and CT (See Wiring Diagram Fig. 4).

MANUAL CRANK (Optional)

If power is interrupted, ram may be actuated by use of the manual crank.

1. Use care that dimensions "A" and "B", as shown on page 3, are not exceeded during manual operation.
2. Push down and rotate palm handle to engage and operate manual crank.



DL66 MODEL "E", "F" & "G" LINEAR ACTUATOR

PARTS LIST

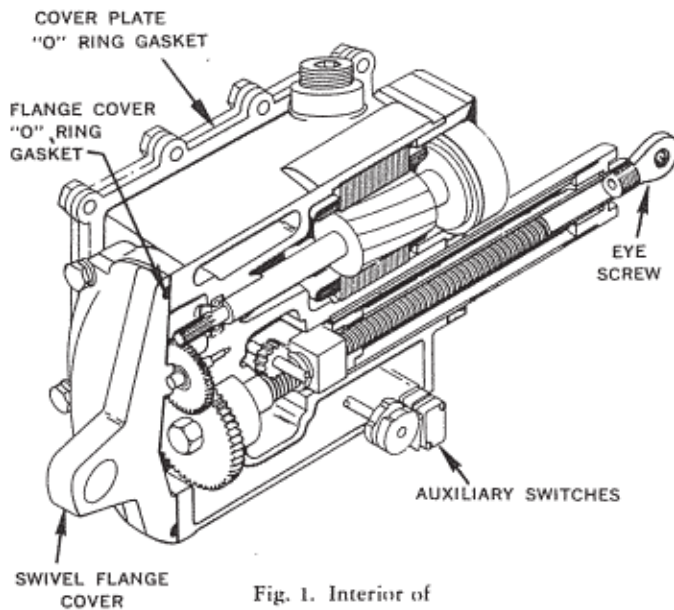


Fig. 1. Interior of
Typical DL66

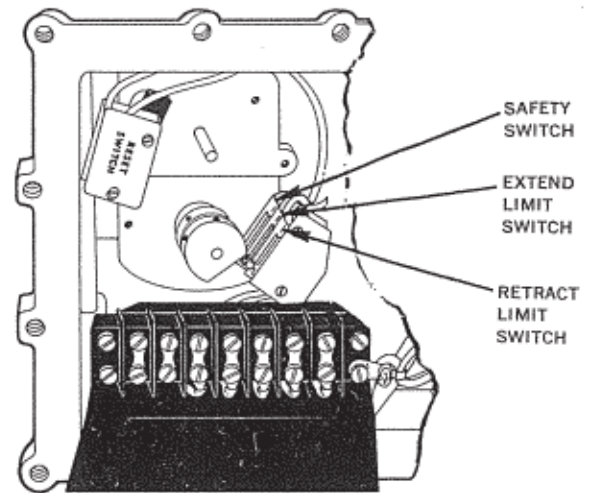


Fig. 2. Limit Switches Shown

HOW TO USE THIS PARTS LIST

Recommended field replaceable parts for DL66 Linear Actuators are covered in this parts list. From your nameplate obtain your complete actuator catalog number.

PARTS and OPTION PARTS Charts

Locate parts required on the appropriate chart or charts. Match your complete catalog number to the partial number in the CATALOG NUMBER column.

On the OPTION PARTS chart take care in matching a catalog number such as DL66C362E12E13H6. This matches DL 66 _____ E12E13H6 *not* DL 66 _____ E12 or DL 66 _____ E13H6.

NOTE

ADDITIONAL PARTS ARE NOT LISTED, AS FURTHER DISASSEMBLY AND REPAIR IS NOT RECOMMENDED IN NORMAL FIELD SERVICE. CONTACT FACTORY FOR ADDITIONAL INFORMATION.

STANDARD PARTS

PART NAME	PART NUMBER
SWIVEL FLANGE COVER	51117FB ^①
SWIVEL FLANGE "O" RING ^②	16606A09-288
BODY COVER (THIN)	59394G ^③
BODY COVER (THICK)	59394FA ^①
BODY COVER "O" RING ^②	16606A09-262 ^②
RESET SWITCH ^③	107268K
EYE SCREW	52791F

^① Optional variations may change these parts.

^② Two required per actuator.

^③ Recommended spare parts.



CATALOG NUMBER

PART NAME	PART NUMBER	DL66C262	DL66C264	DL66C362	DL66C364	DL66C462	DL66C464	DL66C582	DL66C584	DL66D292	DL66D362	DL66D364	DL66D462	DL66D464	DL66D562	DL66D564	DL66D682	DL66D684	DL66-6101	DL66-6102	DL66-6103	DL66-8101	DL66-8102	DL66-8103	DL66-9104
		CAPACITOR [ⓐ]	104857K		●		●		●					●		●		●							
104857L [ⓑ]	●								●	●															
104857M [ⓐ]			●		●		●				●		●		●										
104857P [ⓐ]								●								●									
RECTIFIER ASSY. [ⓐ]	107279A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
	107279B																●	●		●	●				
CIRCUIT BD. ASSY. KIT	S107718C																		●				●	●	
LIMIT SWITCH ASSY. (EXTEND) [ⓐ]	107268F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
	107268H																●	●	●	●	●	●	●	●	●
LIMIT SWITCH ASSY. (RETRACT) [ⓐ]	107268G	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
	107268J																●	●	●	●	●	●	●	●	●
SAFETY SWITCH ASSEMBLY [ⓐ]	107268A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●								
	107268E																●	●	●	●	●	●	●	●	●

- ⓐ Recommended spare parts.
- ⓑ Two capacitors required per unit.
- ⓒ One capacitor required per unit.

OPTION PARTS

CATALOG NUMBER	AUXILIARY SWITCH	INTERNAL POTENTIOMETER KIT	POSITION INDICATOR KIT [ⓐ]	TRANSFORMER [ⓐ]	RAM BOOT OR SLEEVE ASSEMBLY
DL66 _ _ _ _ C2	107253B [ⓐ]				
	107268Q				
DL66 _ _ _ _ C4	107268R				
DL66 _ _ _ _ E11		S108081A			
DL66 _ _ _ _ E12		S108081C			
DL66 _ _ _ _ E13		S108081G			
DL66 _ _ _ _ E14		S108080D			
DL66 _ _ _ _ E15		S108080H			
DL66 _ _ _ _ E17		S108081D			
DL66 _ _ _ _ E19		S108080E			
DL66 _ _ _ _ E20		S108081J			
DL66 _ _ _ _ E21		S108081M			
DL66 _ _ _ _ E22		S108080M			
DL66 _ _ _ _ E12H6		S108081C	S108246A	4B220	
DL66 _ _ _ _ E12H7		S108081C	S108246B	4B221	
DL66 _ _ _ _ E13H6		S108081G	S108246A	4B220	
DL66 _ _ _ _ E13H7		S108081G	S108246B	4B221	
DL66 _ _ _ _ E15H6		S108080H	S108246A	4B220	
DL66 _ _ _ _ E15H7		S108080H	S108246B	4B221	
DL66 _ _ _ _ E19H6		S108080E	S108246A	4B220	
DL66 _ _ _ _ E19H7		S108080E	S108246B	4B221	
DL66 _ _ _ _ E12E13H6		S108080K	S108246A	4B220	
DL66 _ _ _ _ E12E13H7		S108080K	S108246B	4B221	
DL66 _ _ _ _ E12E20H6		S108080L	S108246A	4B220	
DL66 _ _ _ _ E12E20H7		S108080L	S108246B	4B221	
DL66 _ _ _ _ E23		S108081N			
DL66 _ _ _ _ E24		S108080P			
DL66 _ _ _ _ E25		S108080N			
DL66C _ _ _ P1					107098A
DL66D _ _ _ P1					107098B
DL66E _ _ _ P1					107098C

- ⓐ NOTE: POSITION INDICATOR KIT CAN ONLY BE USED IF ACTUATOR IS ORDERED WITH "E" OPTION AS INDICATED.
- ⓑ POSITION INDICATOR KIT consists of METER PT. No. 107026A[ⓐ], CALIBRATING POTENTIOMETER PT. No. 104456B[ⓐ] and TRANSFORMER[ⓐ].
- ⓒ Individual parts of POSITION INDICATOR KIT may be ordered separately.
- ⓓ Recommended spare part.