CLARKE PLD™

PRESSURE LIMITING DRIVERS

FIRE PUMP ENGINES

SERIES

JU4H JW6H
JU6H JX6H

PLD Models for Discharge & Suction Pressure Limiting Control

FM-UL-cUL APPROVED RATINGS BHP/*kW*

Certified Models ♦	NSPS Emissions Tier	Engine Fuel Management Control	Discharge Control Limiting Pressure (psi)	Suction Control Limiting Pressure (psi)	US-EPA (NSPS) Available Until ●	Certified Speed (RPM) & Nameplate Power (BHP/*kW*)									
						1760		2100		2350		2400		2600	
JU4H-UF10-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010	41	*31*	51	*38*	55	*41*				
JU4H-UF12-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010					55	*41*			*59*	*44*
JU4H-UF20-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010	60	*45*	67	*50*	72	*54*				
JU4H-UF22-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010					72	*54*			*75*	*56*
JU4H-UF30-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010	64	*48*	79	*59*	85	*63*				
JU4H-UF32-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010					85	*63*			*85*	*63*
JU4H-UF40-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2010▼ 12/31/2009▲	94	*70*	105	*78*	106	*79*				
JU4H-UF42-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009					106	*79*			*106*	*79*
JU4H-UFADJG-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	109 [2]	*81* [2]	120 [1,2]	*89* [1,2]	123 [1,2]	*92* [1,2]	123 [1,2]	92 [1,2]		
JU4H-UFADJG-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	109 [2]	*81* [2]	120 [1,2]	*89* [1,2]	123 [1,2]	*92* [1,2]	123 [1,2]	92 [1,2]		
JU4H-UFADJG-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	109 [2]	*81* [2]	120 [1,2]	*89* [1,2]	123 [1,2]	*92* [1,2]	123 [1,2]	92 [1,2]		
JU4H-UF50-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009	110	*82*	130	*97*	127	*95*				
JU4H-UF52-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009					127	*95*			*127*	*95*
JU6H-UF30-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009	140	*104*	160	*119*	160	*119*				
JU6H-UF32-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009					160	*119*			*160*	*119*
JU6H-UFABL0-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2009			173	*129*	173	*129*				
JU6H-UFADK0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	168 [2]	*125* [2]	173 [2]	*129* [2]	175 [1,2]	*131* [1,2]	175 [1,2]	*131* [1,2]		
JU6H-UFADK0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	168 [2]	*125* [2]	173 [2]	*129* [2]	175 [1,2]	*131* [1,2]	175 [1,2]	*131* [1,2]		
JU6H-UFADK0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	168 [2]	*125* [2]	173 [2]	*129* [2]	175 [1,2]	*131* [1,2]	175 [1,2]	*131* [1,2]		
JU6H-UF50-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2008	183	*137*	210	*157*	210	*157*				
JU6H-UF52-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2008					210	*157*			*210*	*157*
JU6H-UF60-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2008	200	*149*	240	*179*	240	*179*				
JU6H-UF62-P1	T1 Complaint	Mechanical	100, 170, 240 (A)		12/31/2008					240	*179*			*240*	*179*
JU6H-UFADP0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	220 [2]	*164* [2]	209 [1,2]	*156* [1,2]	211 [1,2]	*157* [1,2]	211 [1,2]	157 [1,2]		
JU6H-UFADP0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	220 [2]	*164* [2]	209 [1,2]	*156* [1,2]	211 [1,2]	*157* [1,2]	211 [1,2]	157 [1,2]		
JU6H-UFADP0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	220 [2]	*164* [2]	209 [1,2]	*156* [1,2]	211 [1,2]	*157* [1,2]	211 [1,2]	157 [1,2]		
JU6H-UFADQ0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration			224 [1,2]	*167* [1,2]	226 [1,2]	*169* [1,2]	226 [1,2]	169 [1,2]		
JU6H-UFADQ0-S	T3 Certified	Electronic			No Expiration			224 [1,2]	*167* [1,2]	226 [1,2]	*169* [1,2]	226 [1,2]	169 [1,2]		
JU6H-UFADQ0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration			224 [1,2]	*167* [1,2]	226 [1,2]	*169* [1,2]	226 [1,2]	169 [1,2]		
JU6H-UFADR0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration			238 [1,2]	*177.5* [1,2]	240 [1,2]	*179* [1,2]	240 [1,2]	179 [1,2]		
JU6H-UFADR0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration			238 [1,2]	*177.5* [1,2]	240 [1,2]	*179* [1,2]	240 [1,2]	179 [1,2]		
JU6H-UFADR0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration			238 [1,2]	*177.5* [1,2]	240 [1,2]	*179* [1,2]	240 [1,2]	179 [1,2]		
JU6H-UFADS0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration			260 [1,2]	*194* [1,2]	268 [1,2]	*200* [1,2]	268 [1,2]	200 [1,2]		
JU6H-UFADS0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration			260 [1,2]	*194* [1,2]	268 [1,2]	*200* [1,2]	268 [1,2]	200 [1,2]		
JU6H-UFADS0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration			260 [1,2]	*194* [1,2]	268 [1,2]	*200* [1,2]	268 [1,2]	200 [1,2]		
JU6H-UFADT0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	229 [2]	*171* [2]	274 [1,2]	*204* [1,2]	275 [1,2]	*205* [1,2]	275 [1,2]	205 [1,2]		
JU6H-UFADTO-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	229 [2]	*171* [2]	274 [1,2]	*204* [1,2]	275 [1,2]	*205* [1,2]	275 [1,2]	205 [1,2]		
JU6H-UFADT0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	229 [2]	*171* [2]	274 [1,2]	*204* [1,2]	275 [1,2]	*205* [1,2]	275 [1,2]	205 [1,2]		
JW6H-UFADD0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	324 [2]	*242* [2]	351 [1,2]	*262* [1,2]						
JW6H-UFADD0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	324 [2]	*242* [2]	351 [1,2]	*262* [1,2]						
JW6H-UFADD0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	324 [2]	*242* [2]	351 [1,2]	*262* [1,2]						
JX6H-UFADK0-D	T3 Certified	Electronic	100 – 350 (B)		No Expiration	517 [2]	*385.5* [2]	526 [1,2]	*392* [1,2]						
JX6H-UFADK0-S	T3 Certified	Electronic		5 – 30 (C)	No Expiration	517 [2]	*385.5* [2]	526 [1,2]	*392* [1,2]						
JX6H-UFADK0-DS	T3 Certified	Electronic	100 – 350 (B)	5 – 30 (C)	No Expiration	517 [2]	*385.5* [2]	526 [1,2]	*392* [1,2]						

● Applies to John Deere model year per Table 4 to Subpart IIII of 40 CFR Part 60
♦ All Models available for Export
▼ Applies to models less than 100 HP
▲ Applies to models greater than 99 HP

[1] Available for installations inside the USA
[2] Available for installations outside the USA

Table 1

(A) Discharge Set Point Pressure/Maximum Control Pressure is 100/110, 170/175, or 240/250 psi, Factory Set and not field adjustable. Specify Set Point & Maximum Control Pressure at time of order.

(B) Discharge Set Point and Maximum Control Pressure can be Factory Set at any value within this range and is not field adjustable. Specify Maximum Control Pressure value at time of order.

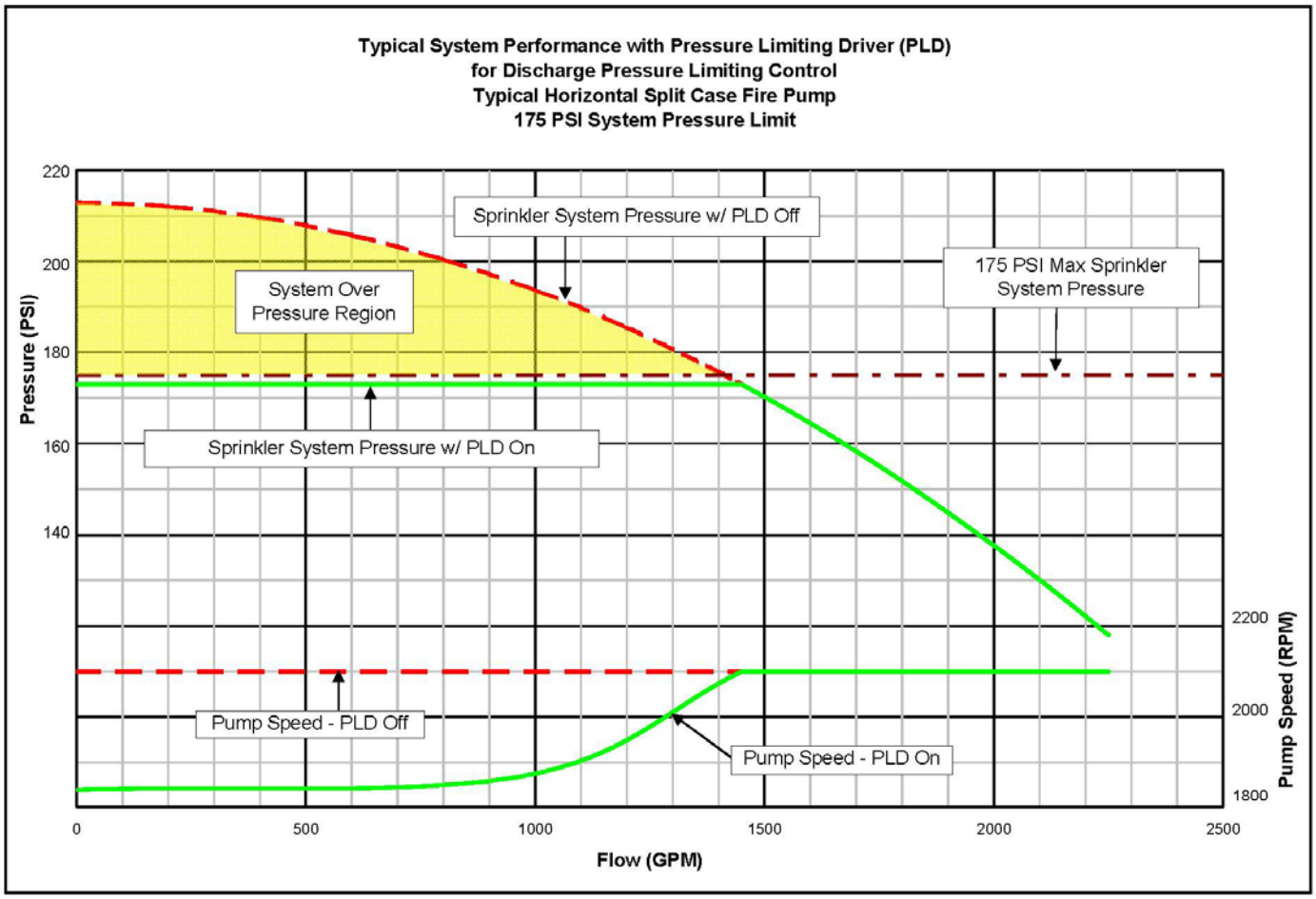
(C) Suction Pressure Limiting Control Set Point can be Factory Set at any value within this range. Set Point is not field adjustable. Specify Control Pressure Set Point at time of order.

-D=Discharge Control, -S=Suction Control, -DS=Both Suction & Discharge Control

c UL us

FM C US APPROVED

Meets NFPA 20 Requirements



Graph 1

Pressure Limiting Driver CLARKE PLD™ Summary – for Discharge Pressure Control

- The Clarke PLD for Discharge Pressure Limiting Control is a UL/FM certified diesel engine fire pump driver which reduces pump speed to limit the maximum pump discharge pressure to prevent over-pressurization of the sprinkler system. See Graph 1
- Certain Clarke PLD equipped engines (-P1 Models) are available with one of three different factory settings: 100 psi (maximum pressure held between 100-110 psi), 170 psi (maximum pressure held between 170-175 psi) and 240 psi (maximum pressure held between 240-250 psi). Refer to Table 1 for Discharge Pressure Limiting Control values.
- Certain Clarke PLD equipped engines (-D and –DS Models) can be Factory Set at any specific pressure between 100 PSI and 350 psi. The value must be factory set and is not field adjustable, refer to Table 1.
- The Clarke PLD senses sprinkler system water pressure via a sensing line connected to the pump discharge pipe (between the pump flange and the discharge check valve), and adjusts engine speed to manage discharge pressure, see Graph 1. NOTE: -P1 models require a drainline, -D and –DS models do not.
- A Clarke PLD requires a controller equipped with visible and audible alarms to comply with NFPA 20 Per 12.4.1.3 (8).
- When using a Clarke PLD for Discharge Pressure Liming Control, NFPA 20 requires the installation of a pressure relief valve.
- During commissioning, the PLD device is turned off in order to verify the performance of the pump to the factory test curve. Therefore fittings and pipe with the appropriate higher pressure rating need to be used from the pump discharge flange to and including the gate or butterfly discharge isolating valve.

PRESSURE LIMITING DRIVERS

FIRE PUMP ENGINES

SERIES

JU4H JW6H
JU6H JX6H

Discharge Pressure Limiting Control

- -P1 Models: 100/110, 170/175, 240/250 psi Factory Set Point/Maximum Pressure (not field adjustable)
- -D Models: 100/350 psi Factory Set Point (not field adjustable)

Features

- Controls System Over-Pressure while meeting NFPA 20.
- Controls System Over-Pressure without any device in the main supply line, where a failure condition of a device in the main supply line could interrupt the water supply.
- Saves design time by eliminating multiple engine/pump combinations as previously necessary. A simple calculation using the Clarke online PLD-D calculator verifies the Clarke PLD equipped engine will keep the sprinkler grid from exceeding the system pressure limit.
- Reduces the quantity of the pressure control valves on high rise applications by limiting the maximum pressure applied to the sprinkler system.
- Enables the use of pumps with steeper rise to shut off pressure curves. Steeper pump curves typically require less horsepower which can reduce the total cost of fire protection.
- Eliminates the discharge of water from the pressure relief valve during the weekly pump test.
- No valve in-line with discharge.
- Allows smaller pipe diameter.
- Eliminates pressure reducing valves in ESFR systems.

NFPA 20 (2010) Language for Use and Acceptability of Variable Speed Pressure Limiting Control

3.3.56 Variable Speed Pressure Limiting Control. A speed control system used to limit the total discharge pressure by reducing the pump driver speed from rated speed.

4.7.7.3.1 Variable speed pressure limiting control drivers, as defined in this standard, shall be acceptable to limit system pressure.

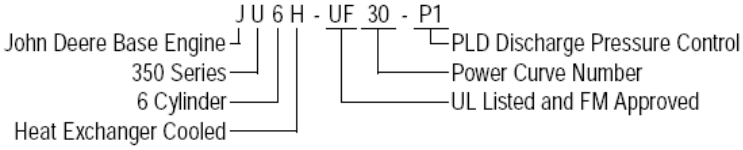
4.7.7.3.2 The set pressure plus maximum pressure variance of the variable speed pressure limiting controlled systems during variable speed operation and adjusted for elevation shall not exceed the pressure rating of any system component.

4.7.7.2 Pressure relief valves and pressure regulating devices in the fire pump installation shall not be used as a means to meet the requirements of 4.7.7.1.

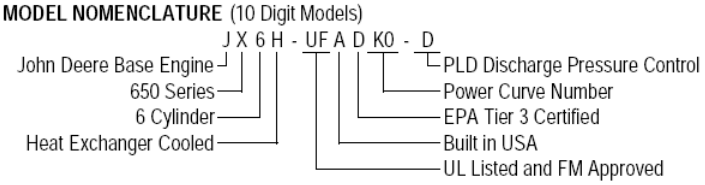
5.18.1.3 Where a diesel engine fire pump is installed and where a total of 121 percent of the net rated shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, exceeds the pressure for which the system components are rated, a pressure relief valve shall be installed.

Each engine has a minimum RPM it can operate down to. In order to determine if the Clarke PLD engine can reduce enough pressure for an installation, each job will need to be reviewed either using the "PLD-D Calculator", found on our website, www.clarkefire.com, or by filling out the PLD-D application Form and faxing to Donna Penter at 513-771-0726 or by e-mailing dpenter@clarkefire.com for review. Clarke must receive a copy of the completed PLD-D Application Form or a copy of the PLD-D Calculator or the PLD-D Log Number form with the order.

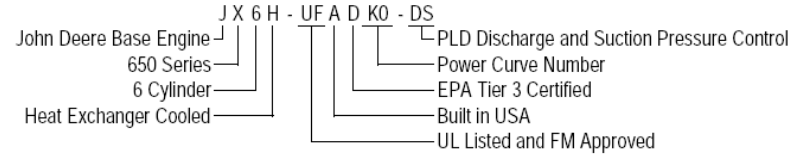
MODEL NOMENCLATURE (8 Digit Models)

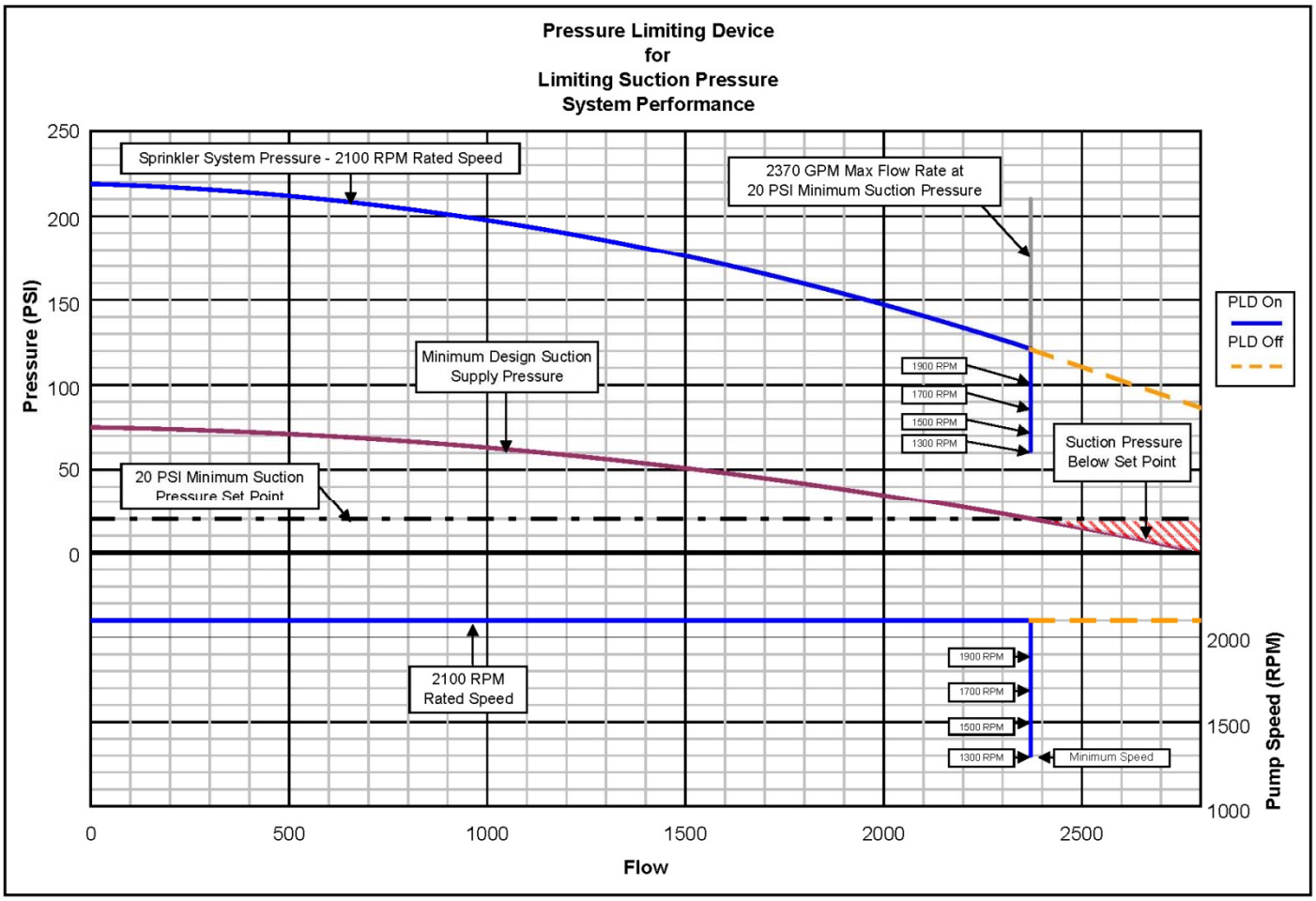


MODEL NOMENCLATURE (10 Digit Models)



MODEL NOMENCLATURE (10 Digit Models)





Graph 1

Pressure Limiting Driver CLARKE PLD

Summary – for Suction Pressure Control

- The Clarke PLD engine for Suction Pressure Limiting Control is a UL/FM certified diesel engine fire pump driver which reduces engine speed to maintain a minimum suction pressure value to prevent under-pressurization of the sprinkler water supply, see Graph 1.

- The Clarke PLD can be factory set at any specific minimum suction pressure between 5 psi and 30 psi. Note this set point is not field adjustable.

- The Clarke PLD senses the fire pump suction pressure via a sensing line connected to the pump supply pipe (between the pump flange and the suction isolating valve), and reduces engine speed to manage suction pressure, see Graph 2.

PRESSURE LIMITING DRIVERS

FIRE PUMP ENGINES

SERIES

JU4H JW6H
JU6H JX6H

Suction Pressure Control

•5-30 psi Factory Set Point (not field adjustable)

Features

•Controls minimum suction pressure while meeting NFPA 20
•Reduces water flow to maintain minimum suction pressure by reducing engine speed.
•Typically will not shut off pump during operation.
•No valve in-line with supply water.
•Substitutes for break tank.
•If minimum suction pressure cannot be maintained, engine will signal controller.
•Designed to protect water supply when number of open sprinkler heads exceeds design criteria.

NFPA 20 (2010) Language for Use and Acceptability of Variable Speed Suction Limiting Control

3.3.57 Variable Speed Suction Limiting Control. A speed control system used to maintain a minimum positive suction pressure at the pump inlet by reducing the pump driver speed while monitoring pressure in the suction piping through a sensing line.

4.15.9 Low Suction Pressure Controls

4.15.9.1 Low suction throttling valves or variable speed suction limiting controls for pump driver that are listed for fire pump service and that are suction pressure sensitive shall be permitted where the authority having jurisdiction requires positive pressure to be maintained on the suction piping.

4.14.9.2 Where the authority having jurisdiction requires positive pressure to be maintained on the suction piping, a pressure-sensing line for a low suction pressure control, specifically listed for fire pump service, shall be permitted to be connected to the suction piping.

Each engine has a minimum RPM it can operate down to. In order to graphically see how a Clarke PLD engine will perform for a specific application, each job will need to be reviewed either using the "PLD-S Calculator", found on our website, www.clarkefire.com, or by filling out the PLD-S Application Form and faxing to Donna Penter at 513-771-2320; or by e-mailing dpenter@clarkefire.com for review. Clarke must receive a copy of the completed PLD-S Application Form or a copy of the PLD-S Calculator Form or the PLD-S log number with the order.

MODEL NOMENCLATURE (10 Digit Models)

J X 6 H - UF A D K0 - S

- J — John Deere Base Engine
- X — 650 Series
- 6 — 6 Cylinder
- H — Heat Exchanger Cooled
- UF — UL Listed and FM Approved
- A — Built in USA
- D — EPA Tier 3 Certified
- K0 — Power Curve Number
- S — PLD Suction Pressure Control

MODEL NOMENCLATURE (10 Digit Models)

J X 6 H - UF A D K0 - DS

- J — John Deere Base Engine
- X — 650 Series
- 6 — 6 Cylinder
- H — Heat Exchanger Cooled
- UF — UL Listed and FM Approved
- A — Built in USA
- D — EPA Tier 3 Certified
- K0 — Power Curve Number
- DS — PLD Discharge and Suction Pressure Control

PRESSURE LIMITING DRIVERS

FIRE PUMP ENGINES

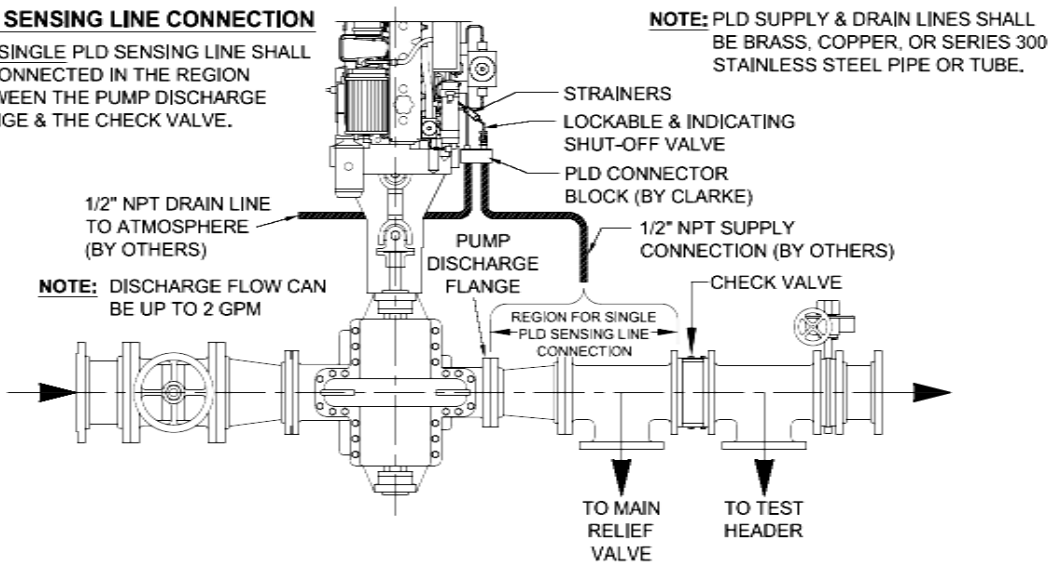
SERIES

JU4H JW6H
JU6H JX6H

PLD SENSING LINE CONNECTION

THE SINGLE PLD SENSING LINE SHALL BE CONNECTED IN THE REGION BETWEEN THE PUMP DISCHARGE FLANGE & THE CHECK VALVE.

NOTE: PLD SUPPLY & DRAIN LINES SHALL BE BRASS, COPPER, OR SERIES 300 STAINLESS STEEL PIPE OR TUBE.



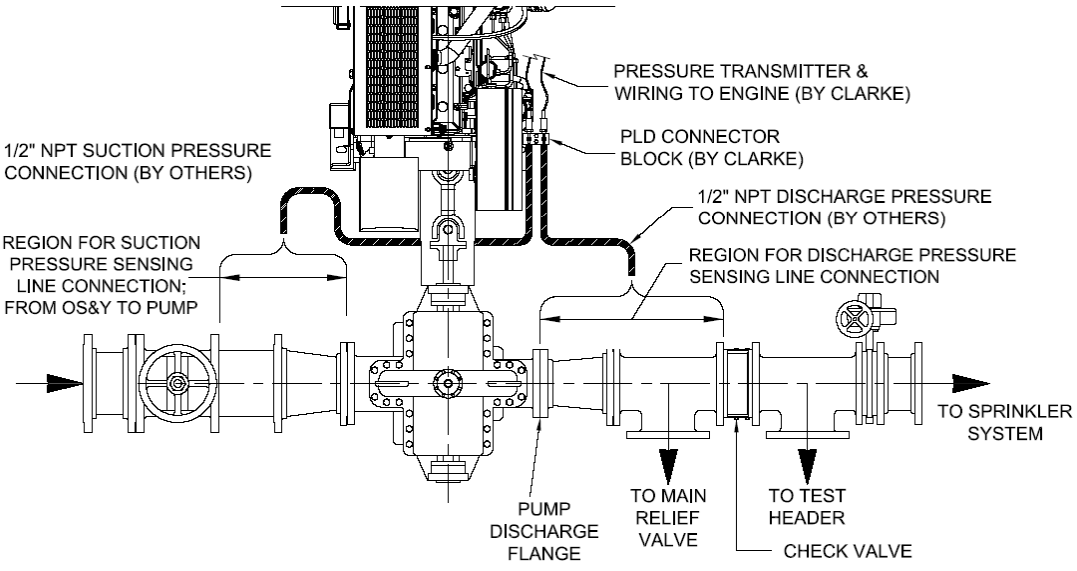
-P1 Engine Models

SUCTION PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE SUCTION PRESSURE LIMITING CONTROL SENSING LINE SHALL BE CONNECTED IN THE IMMEDIATE REGION UPSTREAM OF THE PUMP INLET.

DISCHARGE PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE DISCHARGE PRESSURE CONTROL SENSING LINE SHALL BE CONNECTED IN THE REGION BETWEEN THE PUMP DISCHARGE FLANGE & THE CHECK VALVE.



-D –S and -DS Engine Models

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