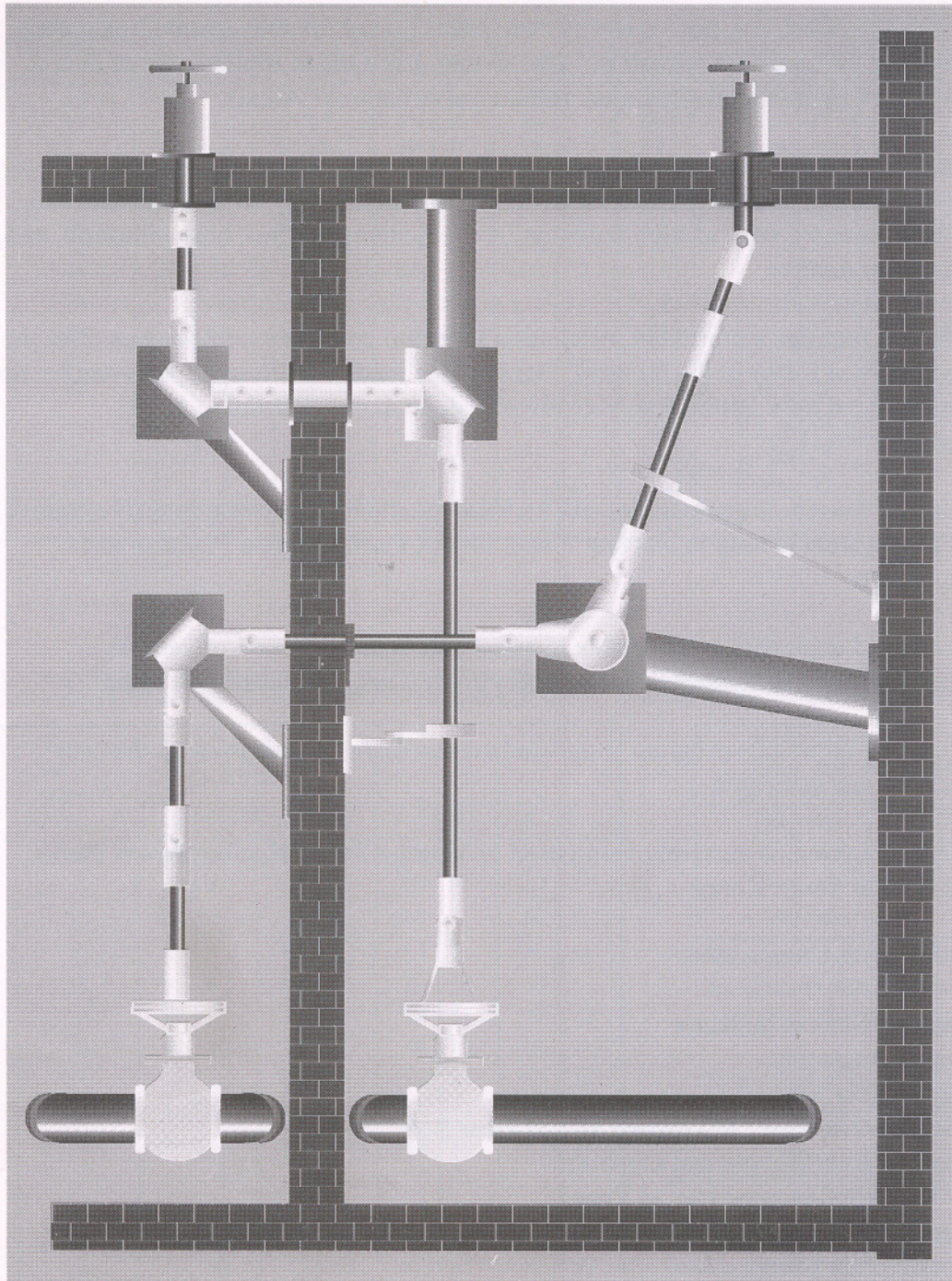


REACH ROD (VALVE EXTENSION) SYSTEM



OUTLINE

The Reach Rod System is a mechanical system that is highly reliable against leakage and can tolerate high pressure and vibration. This system has similar applications as the Hydeck System (hydraulically operated remote valve control system).

The Reach Rod System is specifically designed for applications that require high reliability and used in locations inaccessible to human operation or for maintenance due to hostile environment, such as high radiation, extreme temperatures, high vibration, and hazardous contamination.

The Reach Rod requires a minimum installation time and cost. Our components offer the lowest maintenance factor in the industry. Most of the reach Rod System parts require no service, others need only minimal service, usually done during scheduled plant shutdowns.

The Reach Rod System is compatible with hydraulic and pneumatic remote valve control systems. This system is used in Nuclear Power Plants, Petrochemical Plants, and Processing Plants.

Experienced field engineers are available to assist you in the selection of various components to meet your system needs or assist in the design of the system itself.

Our strict quality assurance program is updated continuously to comply with the ever-changing codes and standards.

The Reach Rod System is currently being used in Young-Gwang Nuclear Power Plants Three and Four in South Korea.

Reach Rod System Components:

- Operating Station Indicator
- Housing Assembly
- Couplings for Valve
- 90 degree Gear Box, 300 degree Swivel Gear Box
- Universal Joint (Single and Double)
- Slip Joint (Splined and Hexed Type)
- Male Drive Operating Station
- Mounting Hardware
- Rigid Rod or Flexible Shaft

MAJOR TECHNICAL INFORMATION FOR DESIGN AND SELECTION

SHAFT CORE DIAMETER SELECTION

Valve Handwheel Dia. (in)	Valve Oper. Torque (ft.lb)	5		6 - 10		11 - 15		16 - 20		21 - 25		26 - 30		31 - 40		41 - 50	
		d	D	d	D	d	D	d	D	d	D	d	D	d	D	d	D
3	10	3/4	5	3/4	5	3/4	5	3/4	5	3/4	5	3/4	7	3/4	7	3/4	7
4	13	3/4	5	3/4	5	3/4	5	3/4	5	3/4	7	3/4	7	3/4	7	3/4	7
5	17	3/4	5	3/4	5	3/4	5	3/4	7	3/4	7	3/4	7	3/4	8	3/4	8
6	20	3/4	7	3/4	7	3/4	7	3/4	7	3/4	8	3/4	8	1	9	1	10
7	26	3/4	8	3/4	8	3/4	8	3/4	8	3/4	8	1	10	1	10	1	12
8	30	3/4	8	3/4	8	1	10	1	10	1	10	1	10	1	12	1	12
9	34	3/4	8	1	10	1	10	1	10	1	10	1	12	1	12	1	12
10	40	1	10	1	10	1	12	1	12	1	12	1	12	1	12	1 1/4	14
11	46	1	12	1	12	1	12	1	12	1	12	1	12	1 1/4	14	1 1/4	16
12	50	1	12	1	12	1	12	1	12	1	12	1	12	1 1/4	16	1 1/4	18
14	70	1 1/4	16	1 1/4	16	1 1/4	16	1 1/4	18	1 1/4	18	1 1/4	18	1 1/4	21	1 5/8	24
16	80	1 1/4	18	1 1/4	18	1 1/4	18	1 1/4	18	1 1/4	18	1 1/4	21	1 5/8	24	1 5/8	27
18	90	1 1/4	18	1 1/4	18	1 1/4	18	1 1/4	21	1 1/4	21	1 5/8	21	1 5/8	24	1 5/8	27
21	122	1 1/4	21	1 1/4	21	1 1/4	21	1 1/4	21	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27
24	140	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27				
27	158	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27	1 5/8	27						

SUGGESTED RIGID ROD GUIDE SELECTION CHART

Valve Handwheel Dia. (in)	Valve Oper. Torque (ft.lb)	1		2		3		4	
		d	D	d	D	d	D	d	D
3	10	1/2	4	1/2	4	1/2	5	1/2	6
4	13	1/2	4	1/2	5	1/2	6	1/2	7
5	17	1/2	6	1/2	6	1/2	7	1/2	9
6	20	1/2	6	1/2	7	1/2	9	3/4	11
7	26	1/2	8	1/2	9	3/4	11	3/4	12
8	30	1/2	9	3/4	10	3/4	11	3/4	12
9	34	3/4	10	3/4	11	3/4	12	3/4	14
10	40	3/4	11	3/4	12	3/4	14	3/4	14
11	46	3/4	12	3/4	12	3/4	14	3/4	16
12	50	3/4	14	3/4	14	3/4	16	1	18
14	70	1	16	1	18	1	21	1	21
16	80	1	18	1	18	1	21	1	24
18	90	1	21	1	21	1	24	1	24
21	122	1	24	1	24	1	27	1 1/4	27
24	140	1 1/4	24	1 1/4	27	1 1/4	27	1 1/4	30
27	158	1 1/4	27	1 1/4	30	1 1/4	30	1 1/4	36
30	175	1 1/4	30	1 1/4	30	1 1/4	36	1 1/4	36
36	210	1 1/4	36						

OPERATING AND DESIGN CONDITIONS

Rod Dia. (inch)	Minimum Operating Torque (ft. lbs)
1/2	min 30
3/4	min 50
1	min 122
1 1/4	min 210

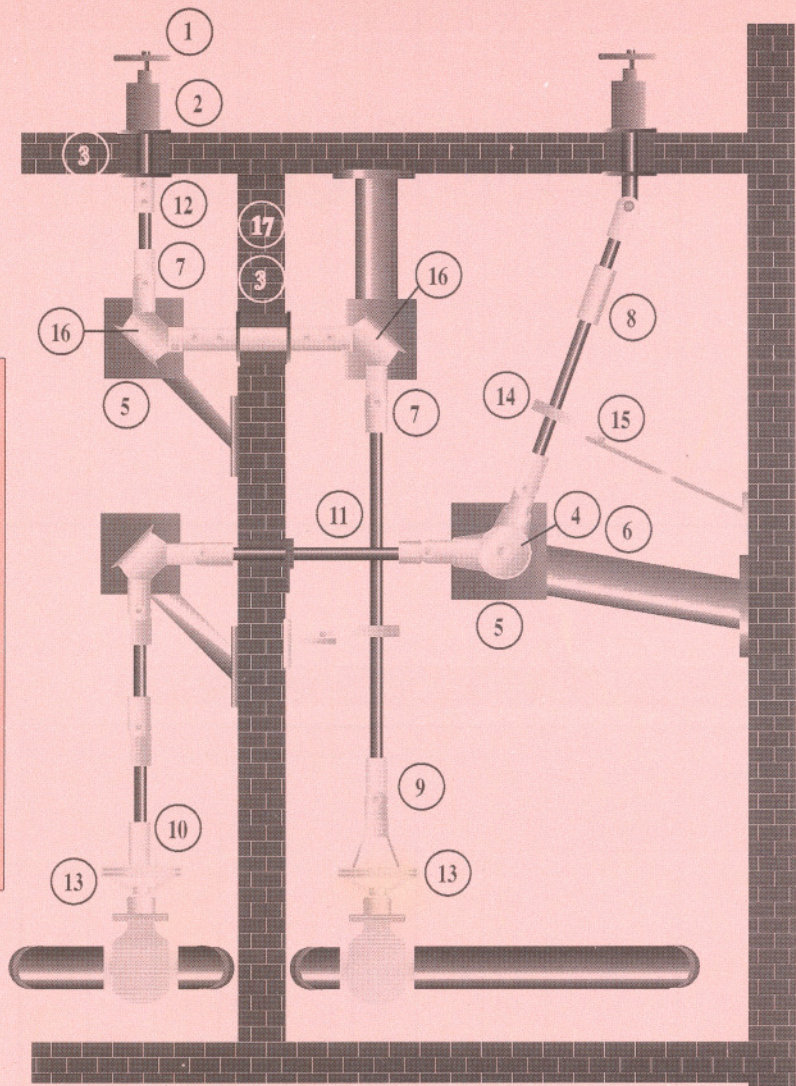
Extension Rod components shall be designed to withstand the minimum operating torque shown above.

Note: d = Rod Diameter (in)
D = Remote Hand wheel Diameter (in)

Design Factors (Typical systems, consist of the following components.)

1. Remote Operating Station (1); Universal Joints (2)
2. Remote Operating Station (1); Gear Box (1); Universal Joints (4)
3. Remote Operating Station (1); Gear Box (2); Universal Joints (8)
4. Remote Operating Station (1); Intermediate Connection (1); Gear Box (3); Universal Joints (10)

REACH ROD (VALVE EXTENSION) SYSTEM



The above Reach Rod System configuration is currently being used in Young-Gwang Nuclear Power Plants Three and Four in South Korea.



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