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(주)유응연

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(주)유응연 / 유압응용연구소

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# Hydro- Electronic Application Development

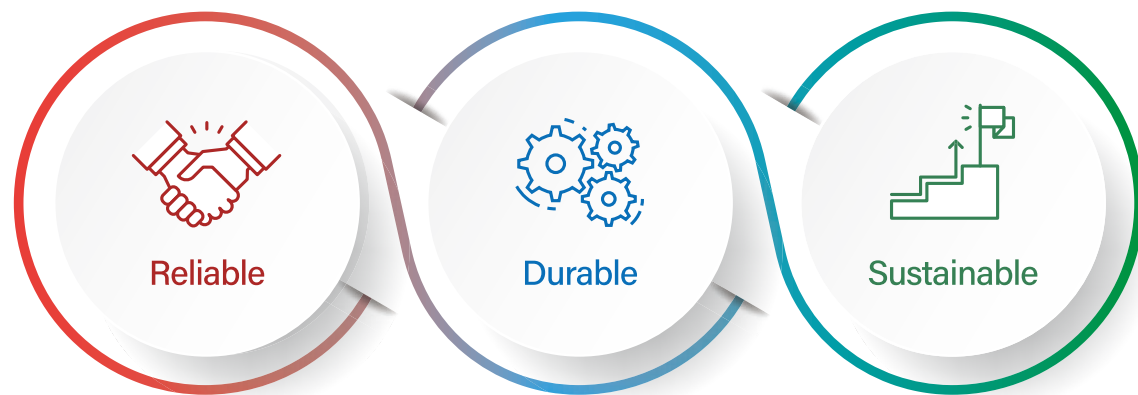


## Mission

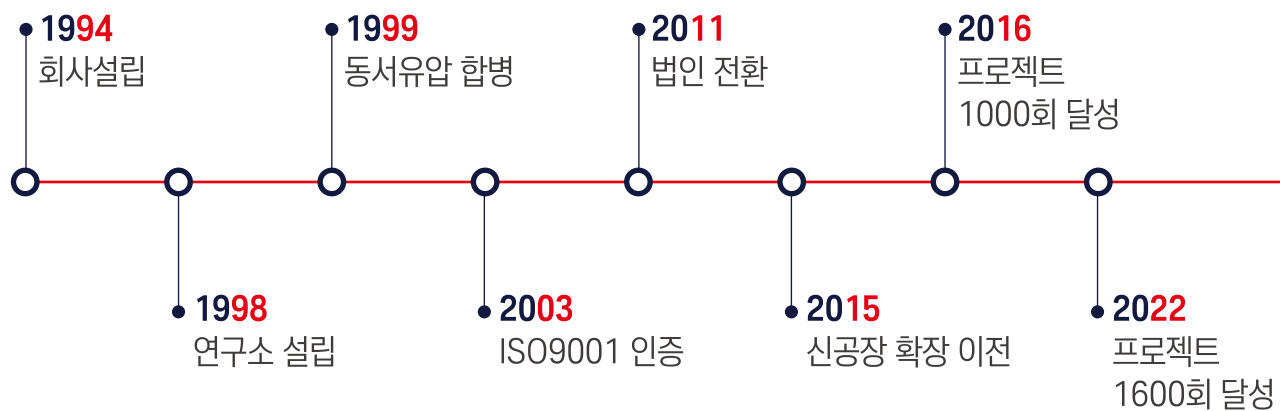
### We build your confidence.

HEAD 는 유압시스템을 개발, 설계, 제작합니다.  
30년 간의 경험을 바탕으로 파트너사의 성장을 약속합니다.  
기술과 품질에 대한 자부심, HEAD 와 함께 만들어가세요.

## Value



## History



## Business Area

HEAD의 유압시스템은 다양한 분야에 활용됩니다.



## Research Area

HEAD는 지속적인 연구개발을 통해 세계최고의 유압시스템을 공급하기 위해 최선을 다합니다.







# High Performance Testing System

- 유압 밸브 시험
- 유압 모터 시험
- 유압 / 일반 펌프 시험
- 유압부품 종합시험
- 액추에이터 시험
- 유압 임펄스 시험
- 다이나모
- 인장, 압축, 비틀림 시험
- 통합온도 시험 (온도+압력)



- Basic Model : 수리 및 정비 업체용
- Standard Model : 양산제품 시험용
- Advanced Model : 연구개발용

SPECIFICATION	BASIC	STANDARD	ADVANCED
Function Test	○	○	○
Performance Test	-	○	○
Development Test	-	-	○
Safety Cover	○	○	○
Hydraulic Power Pack	○	○	○
Filter (in-line)	○	○	○
Filter (off-line)	-	○	○
Temp Control Unit	-	○	○
Manual Control Panel	○	○	○
Analogue Gauge	○	○	○
1st Safe Mode (inter-lock)	○	○	○
2nd Safe Mode (Fire Protection)	-	-	○
Control Rack	-	○	○
Digital Indicator	-	○	○
PC & Printer	-	○	○
Automatic Testing Program	-	○	○
Reporting App	-	○	○
Dual Monitor	-	-	○
Additional Sensor	-	-	○

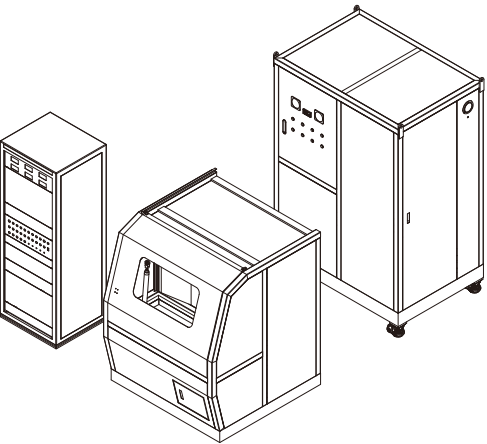




# HYDRAULIC VALVE TESTING

HEAD의 밸브 시험장비는 단일 카드리지 타입부터 복잡한구조의 섹션타입까지 다양한 구조의 밸브성능을 평가합니다.

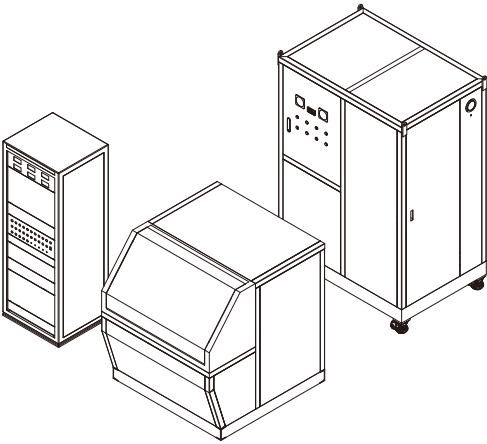
## Cartridge Type Valve Tester



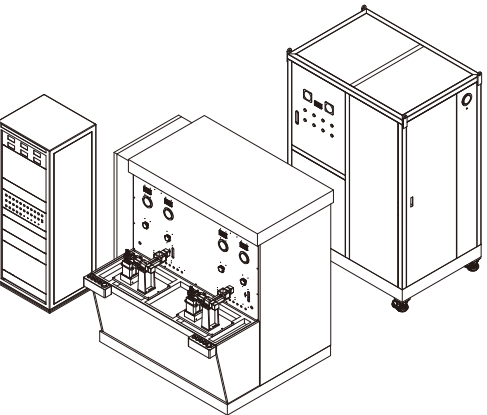
Main Pressure	Max. 420 bar
Pilot Pressure	Max. 300 bar
Main Flow Rate	Max. 160 LPM
Pilot Flow Rate	6 LPM
Temperature	40 ~ 80 °C

## Proportional Valve Tester

Pressure	Max. 100 bar
Flow Rate	Max. 30 LPM
Temperature	50±5 °C
Current (12V)	1800 mA
Current (24V)	800 mA



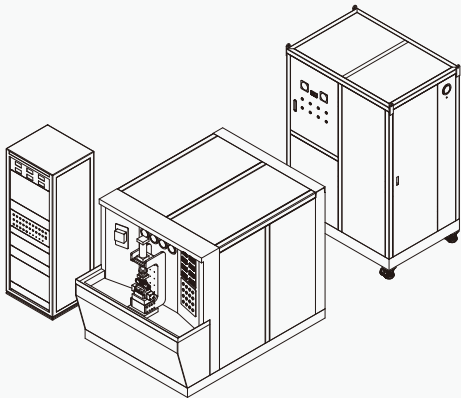
## Remote Control Valve Tester



Pressure	Max. 110 bar
Flow Rate	35 LPM
Temperature	50±5 °C



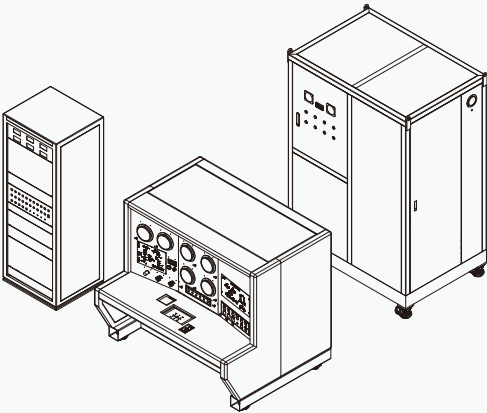
## CETOP Type Valve Tester



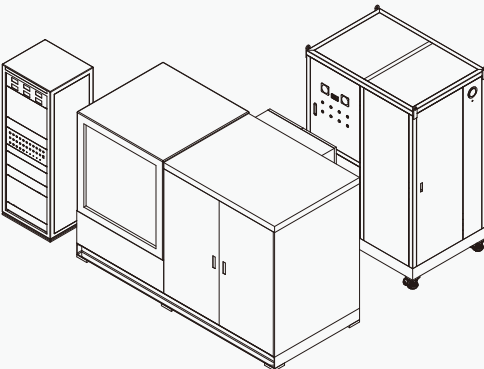
Main Pressure	Max. 320 bar
Main Flow Rate	Max. 120 LPM
Temperature	40 ~ 80 °C

## Servo Valve Tester

P1 Pressure	Max. 4000 PSI
P2 Pressure	Max. 7000 PSI
P1 Flow Rate	Max. 110 LPM
P2 Flow Rate	Max. 11 LPM
Temperature	40 ~ 80 °C
Current	Max. ±50 / 250 mA



## Valve Body Tester



Pressure	Max. 50 bar
Flow Rate	Max. 75 LPM
Temperature	160±5 °C

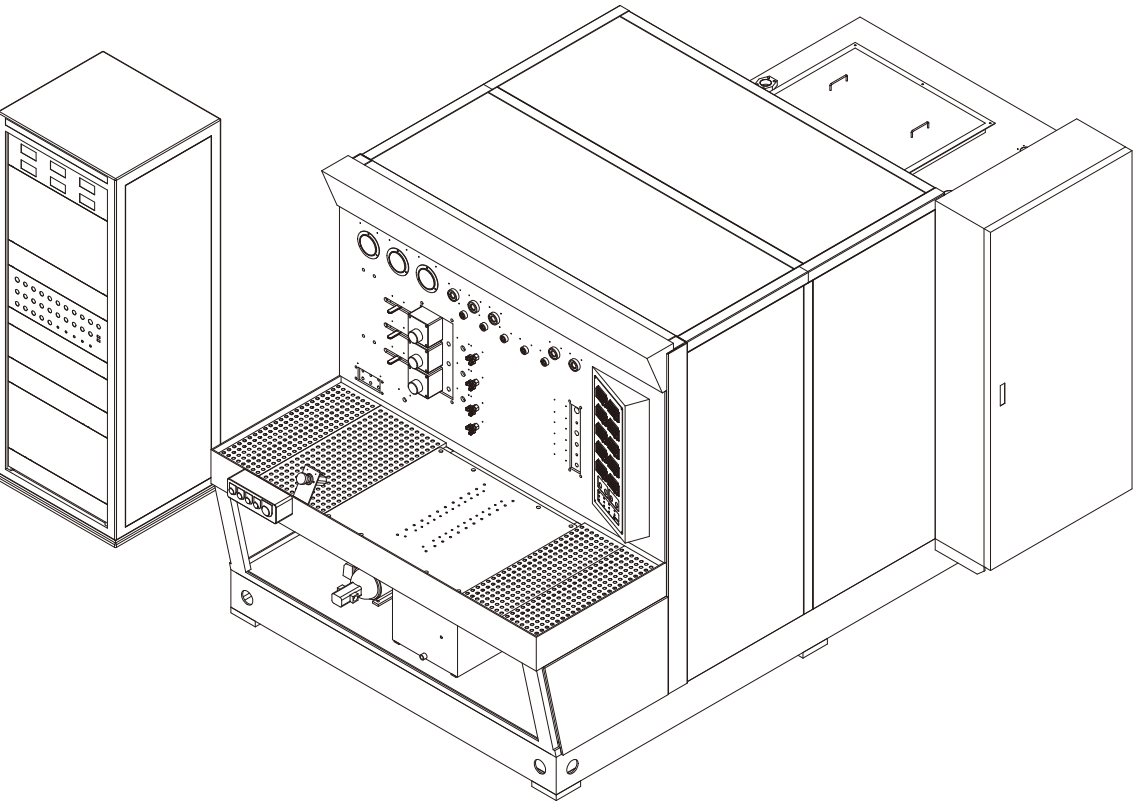




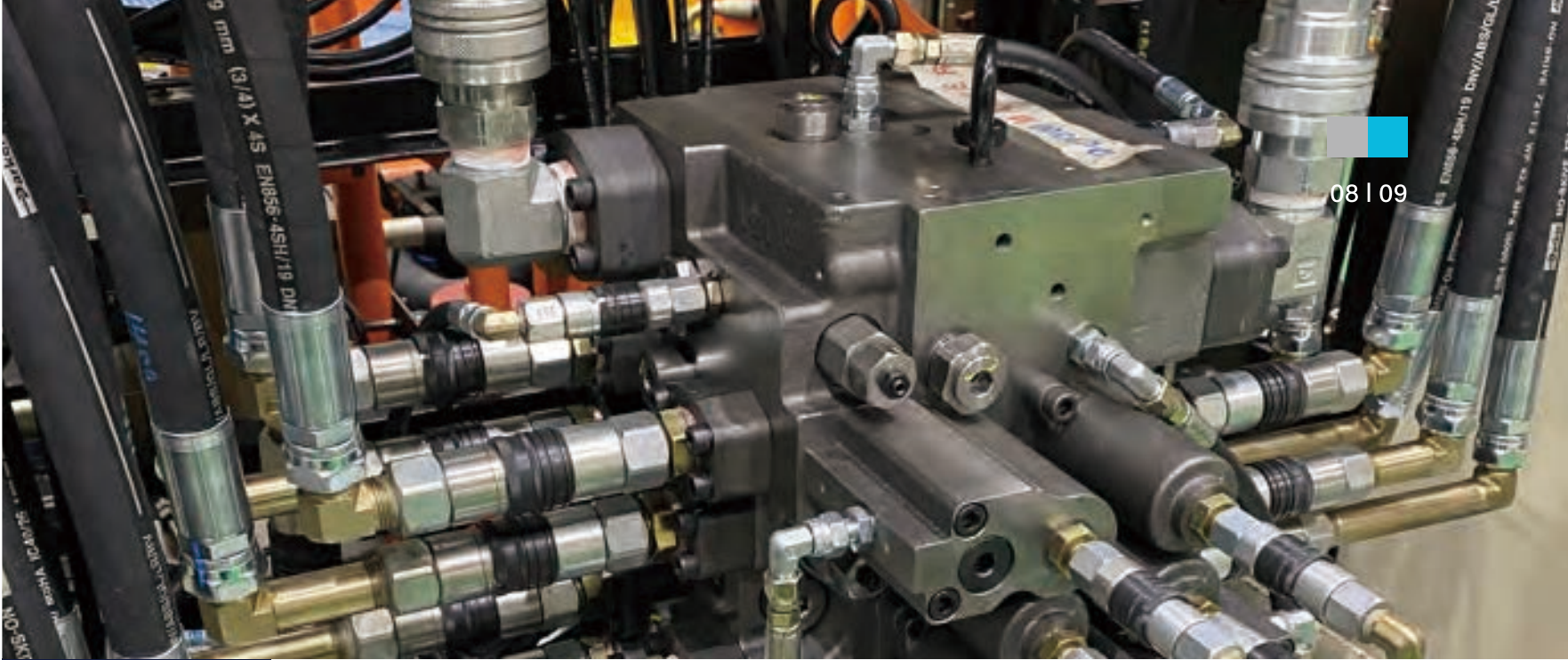
# HYDRAULIC VALVE TESTING

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Main Control Valve Tester (Section Type)

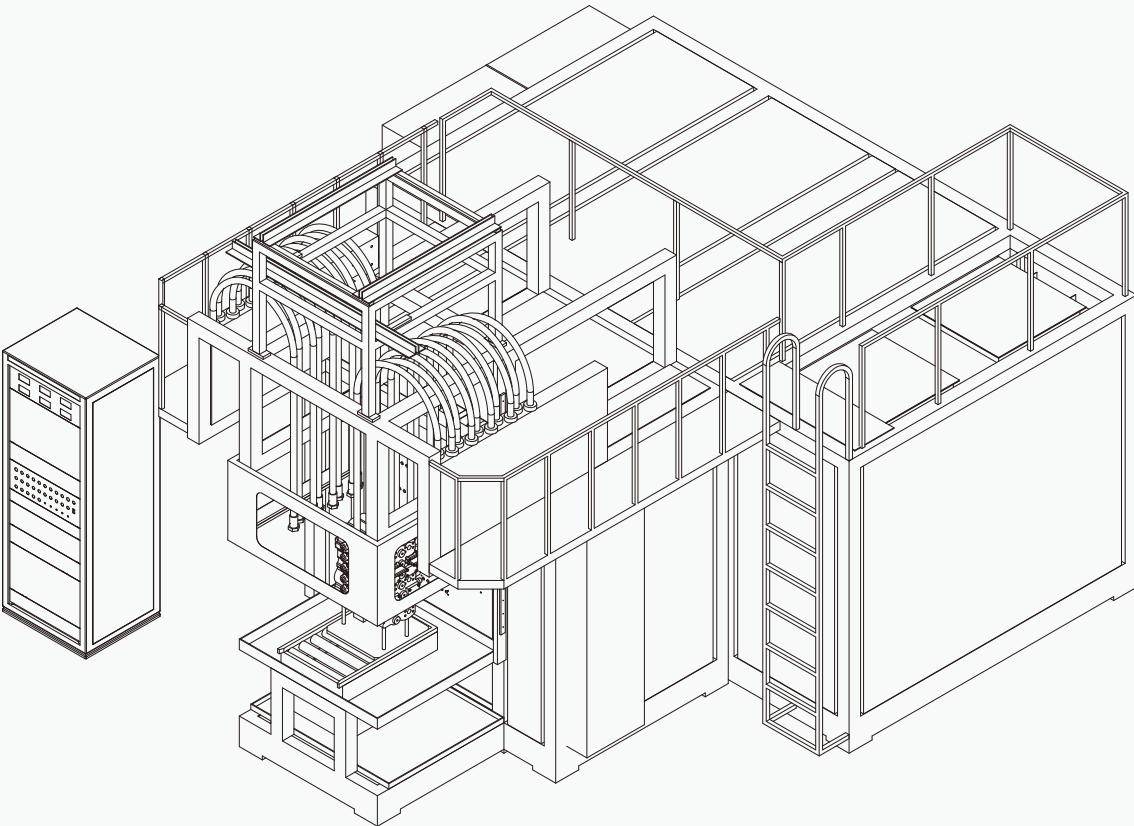


Main Pressure	Max. 350 bar
Pilot Pressure	40 bar
Main Flow Rate	Max. 180 LPM
Pilot Flow Rate	13 LPM
Temperature	50±5 °C



Main Control Valve Tester (Mono Type)

Main Pressure	Max. 420 bar
Pilot Pressure	140 bar
Main Flow Rate	Max. 300 LPM
Pilot Flow Rate	30 LPM
Temperature	50±5 °C



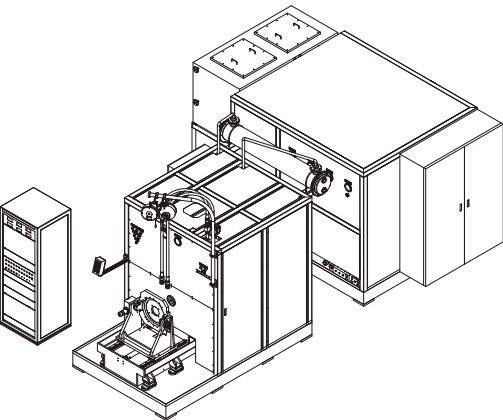




# HYDRAULIC MOTOR TESTING

HEAD 의 모터 시험장비는 베인, 사축, 사판 등 다양한 유압모터의 성능을 평가합니다.

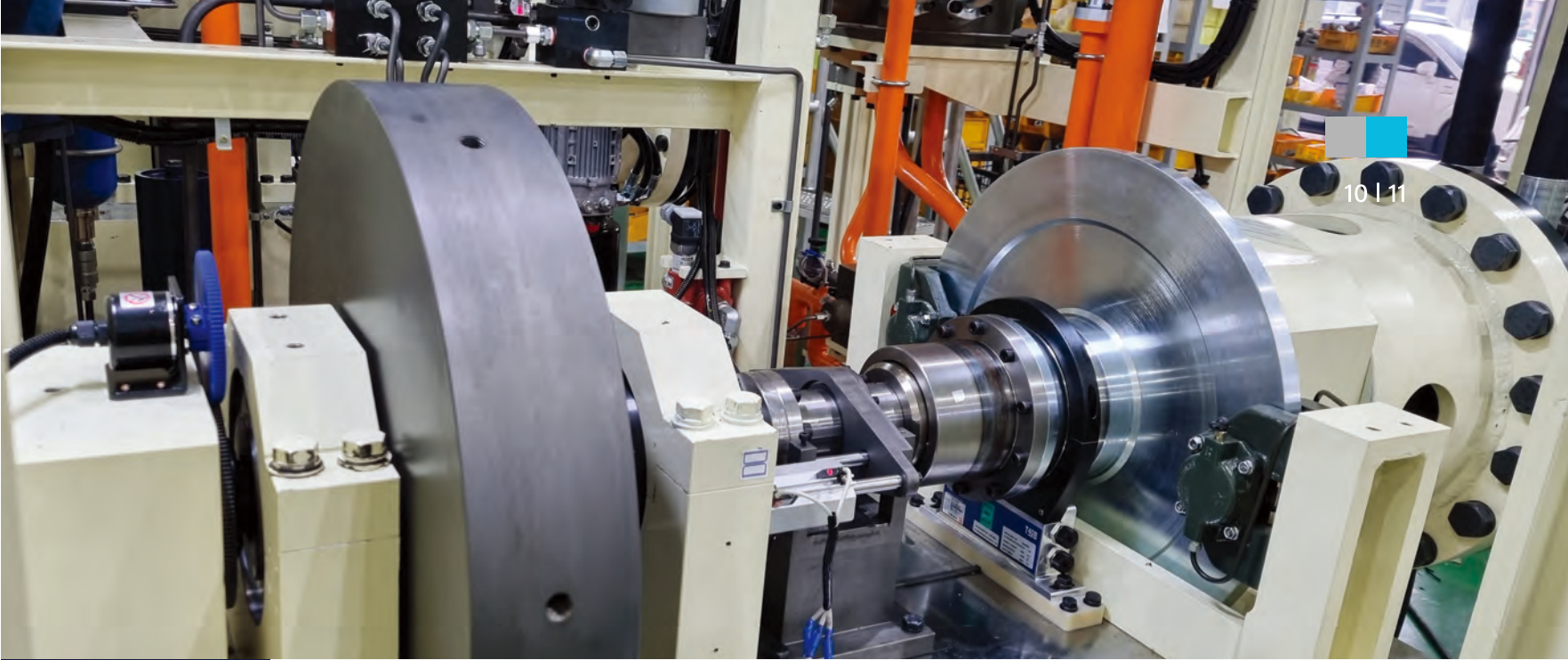
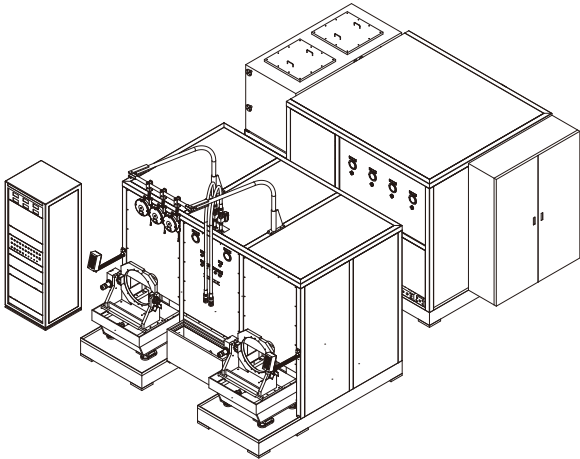
Hydraulic Motor Tester (1 station)



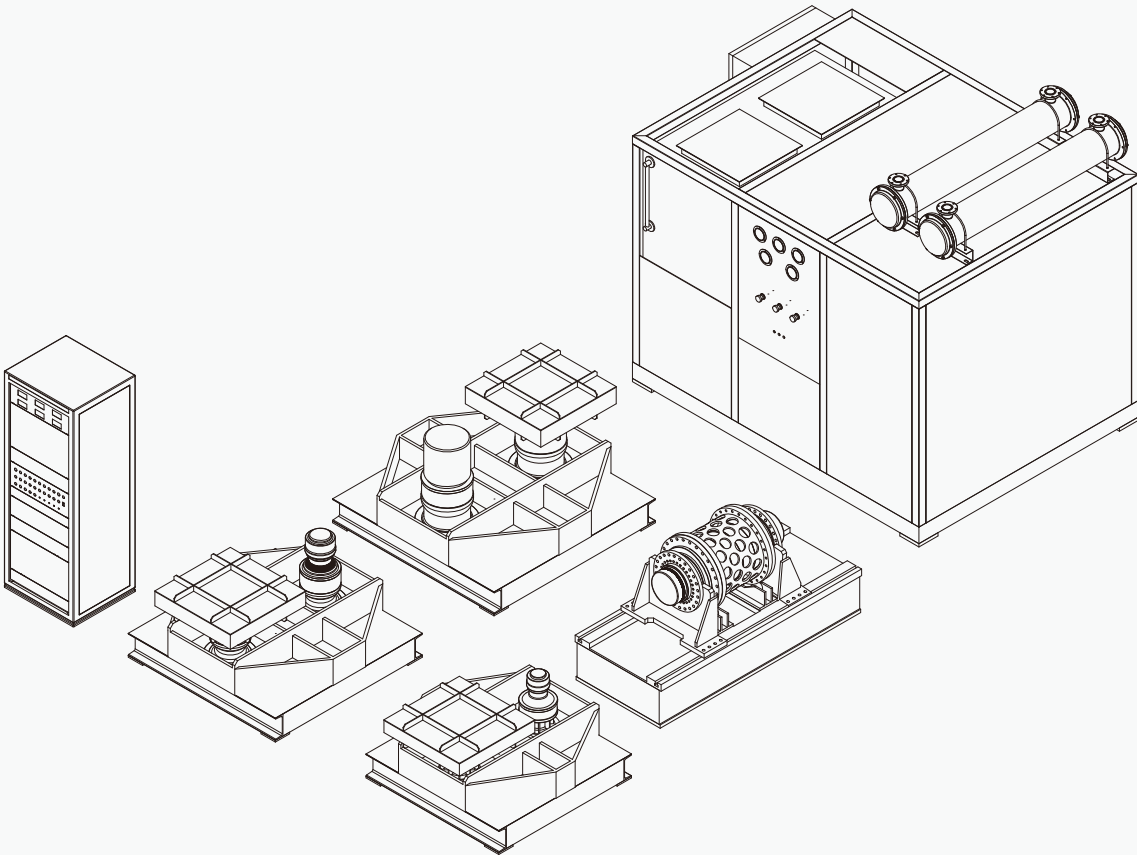
Main Pressure	Max. 420 bar
Pilot Pressure	50 bar
Main Flow Rate	Max. 300 LPM
Pilot Flow Rate	35 LPM
Temperature	50±5 °C

Hydraulic Motor Tester (2 station)

Main Pressure	Max. 420 bar
Pilot Pressure	50 bar
Main Flow Rate	Max. 300 LPM
Pilot Flow Rate	35 LPM
Temperature	50±5 °C



Hydraulic Motor Device Tester



Pressure	Max. 350 bar
Flow Rate	Max. 320 LPM
Temperature	50±5 °C



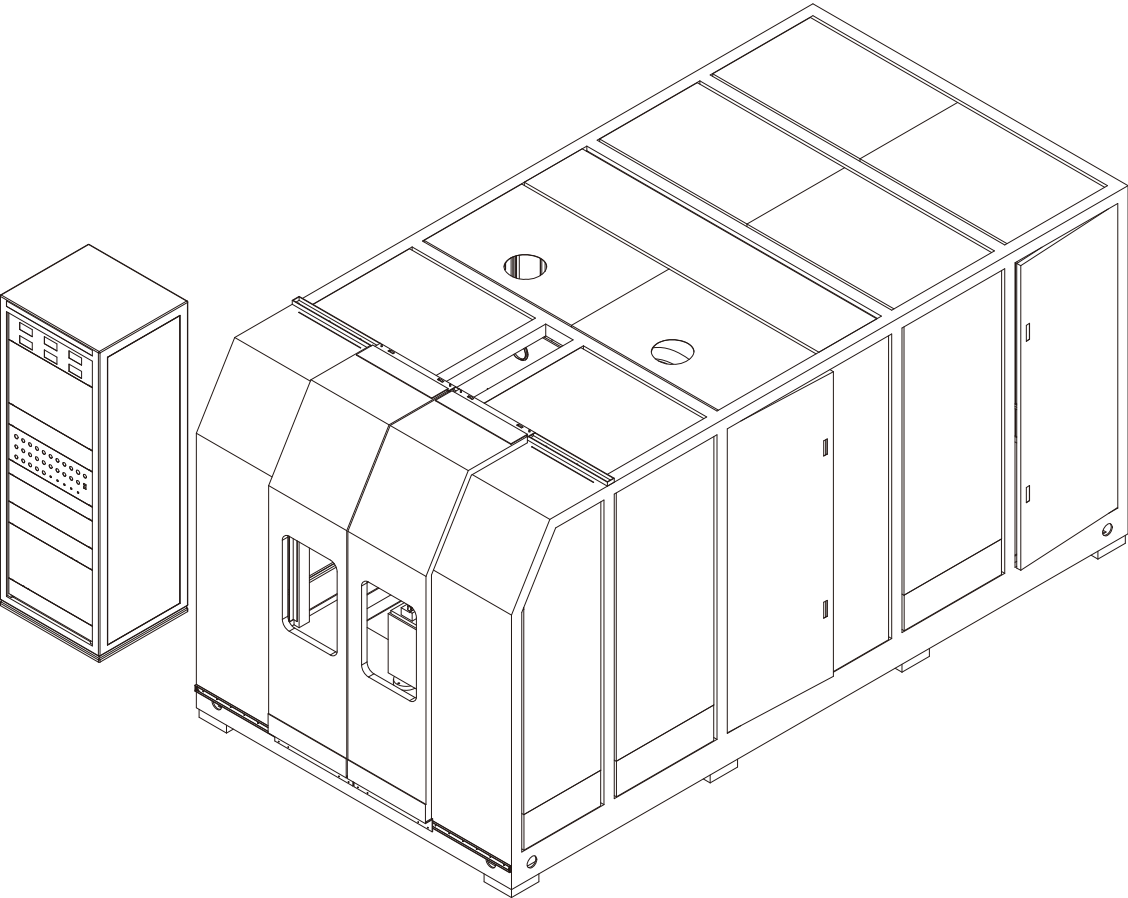


# PUMP TESTING

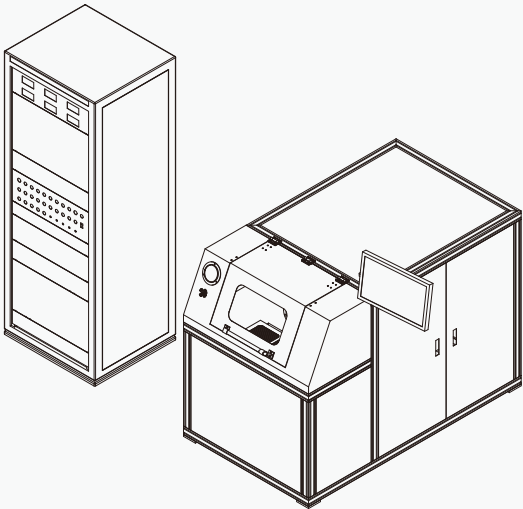
HEAD의 펌프 시험장비는 사축, 사판을 포함한 다양한 유압 펌프와 일반 펌프에 대한 성능을 평가합니다.

## Oil Pump Tester (Large Type)

RPM	600 ~ 2600 rpm
P1, P2 Pressure	Max. 420 bar
P3 Pressure	Max. 100 bar
P1, P2 Flow Rate	Max. 600 LPM
P3 Flow Rate	Max. 200 LPM
Temperature	110±5 °C



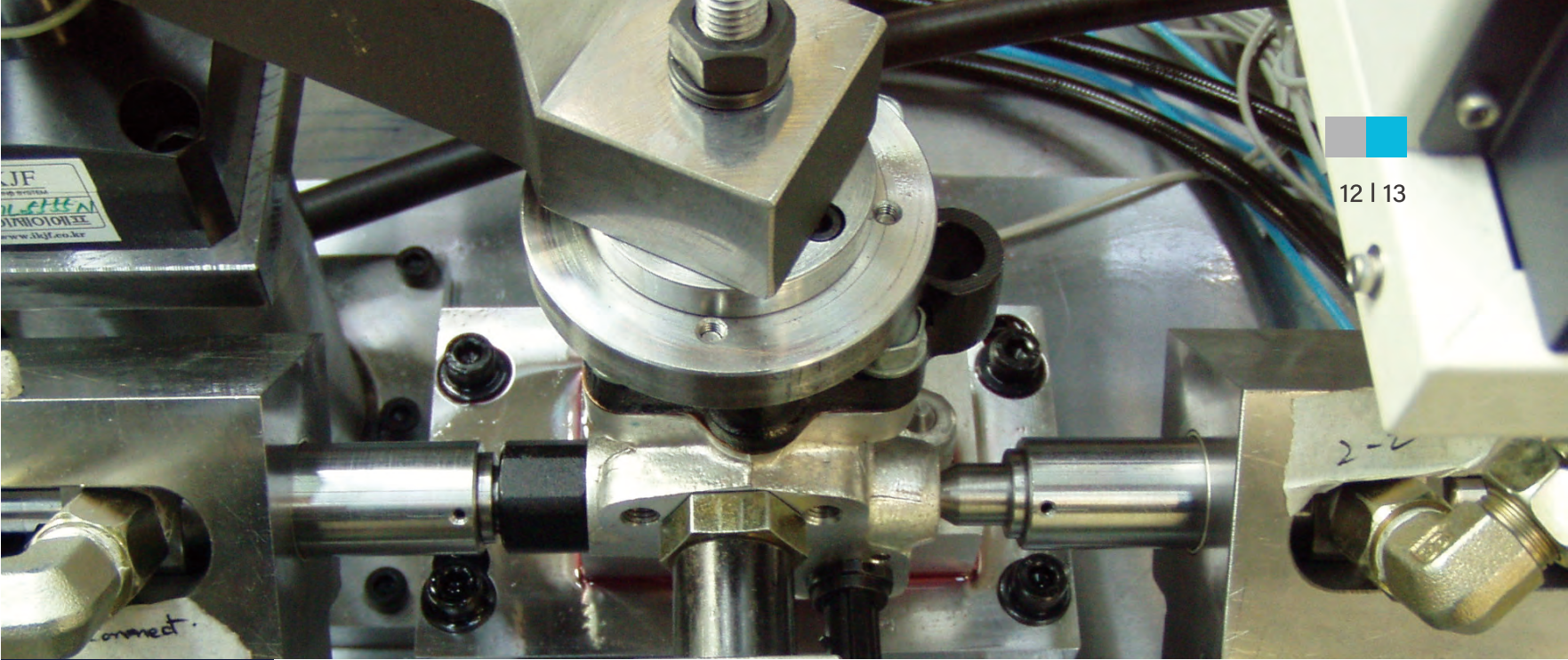
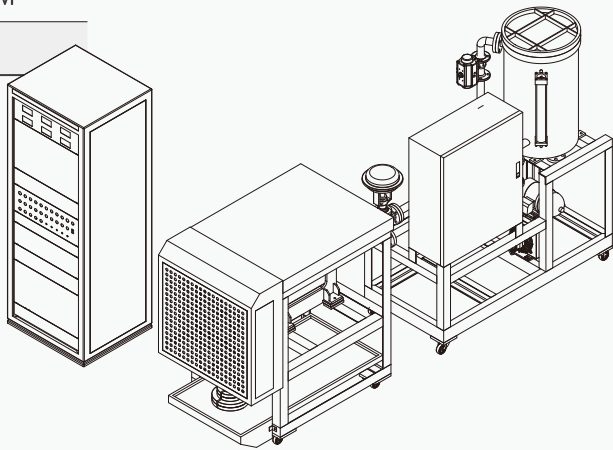
## Oil Pump Tester (Small Type)



RPM	~ 4500 rpm
Pressure	Max. 20 bar
Flow Rate	Max. 50 LPM
Temperature	25 ~ 80 °C

## Water Pump Tester

RPM	~ 10000 rpm
Pressure	Max. 10 bar
Flow Rate	Max. 500 LPM
Temperature	25 ~ 50 °C

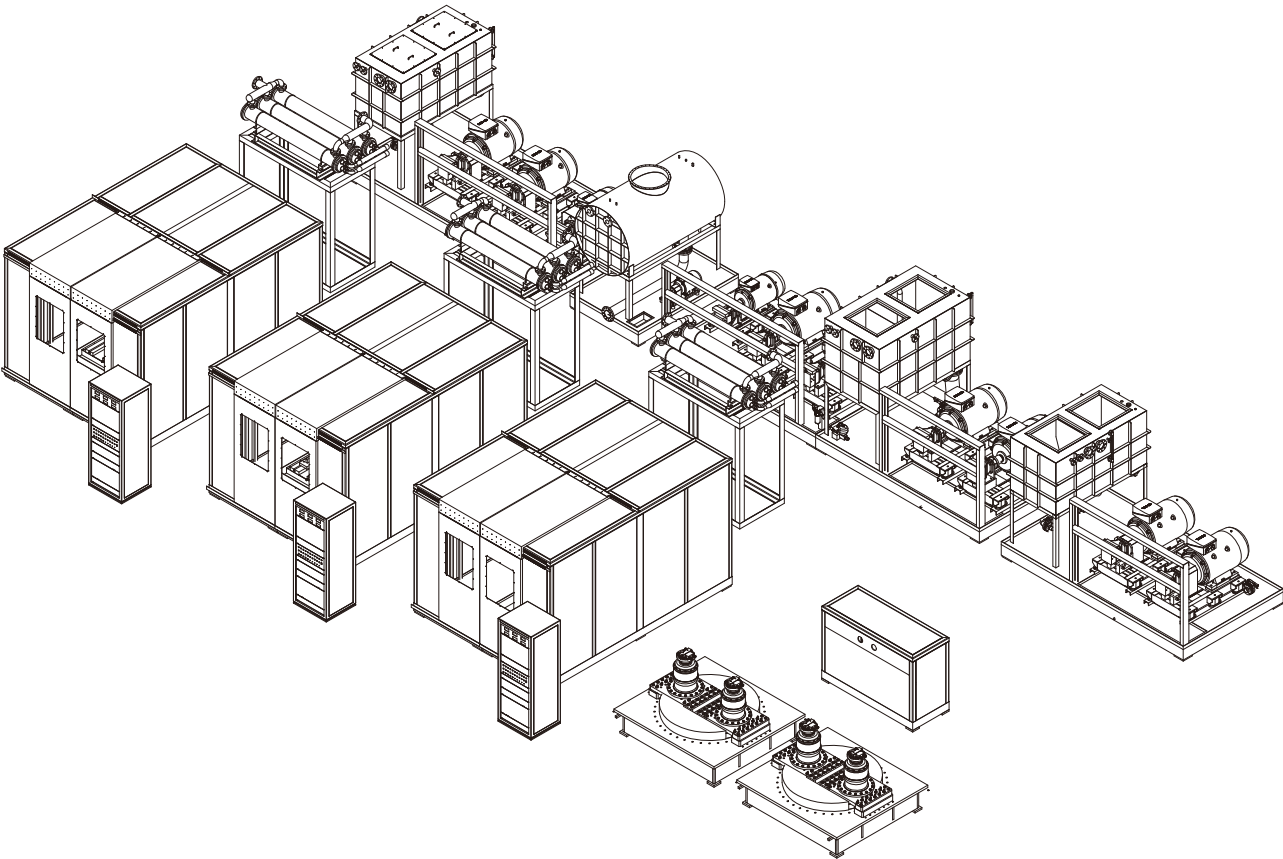




# HYDRAULIC UNIVERSAL

HEAD 의 Hydraulic Universal 은 유압펌프, 모터, 밸브의 성능 평가 가능한 유압부품 종합시험 시스템입니다.

## Hydraulic Component Universal



Hydraulic Pump	
RPM	~ 3000 rpm
P1 Pressure	Max. 420 bar
P2 Pressure	Max. 420 bar
P3 Pressure	Max. 250 bar
P4 Pressure	40 bar
P1 Flow Rate	Max. 400 LPM
P2 Flow Rate	Max. 400 LPM
P3 Flow Rate	Max. 100 LPM
P4 Flow Rate	28 LPM
Temperature	35 - 70 °C

Hydraulic Motor	
RPM	3000 rpm
P1 Pressure	Max. 420 bar
RF Pressure	20 bar
PP Pressure	40 bar
HP Flow Rate	Max. 500 LPM
RF Flow Rate	125 LPM
PP Flow Rate	28 LPM
Temperature	35 - 70 °C

Hydraulic Valve	
HP1 Pressure	Max. 420 bar
HP2 Pressure	Max. 420 bar
HP3 Pressure	Max. 250 bar
PP Pressure	40 bar
HP1 Flow Rate	Max. 400 LPM
HP2 Flow Rate	Max. 400 LPM
HP3 Flow Rate	Max. 100 LPM
PP Flow Rate	28 LPM
Temperature	35 - 70 °C

Swing Device	
HP Pressure	Max. 420 bar
RF Pressure	20 bar
PP Pressure	40 bar
HP Flow Rate	Max. 400 LPM
RF Flow Rate	125 LPM
PP Flow Rate	28 LPM
Temperature	35 - 70 °C





# HYDRAULIC UNIVERSAL

HEAD 의 Hydraulic Universal 은 유압펌프, 모터, 밸브의 성능 평가 가능한 유압부품 종합시험 시스템입니다.

## Hydraulic Motor Universal

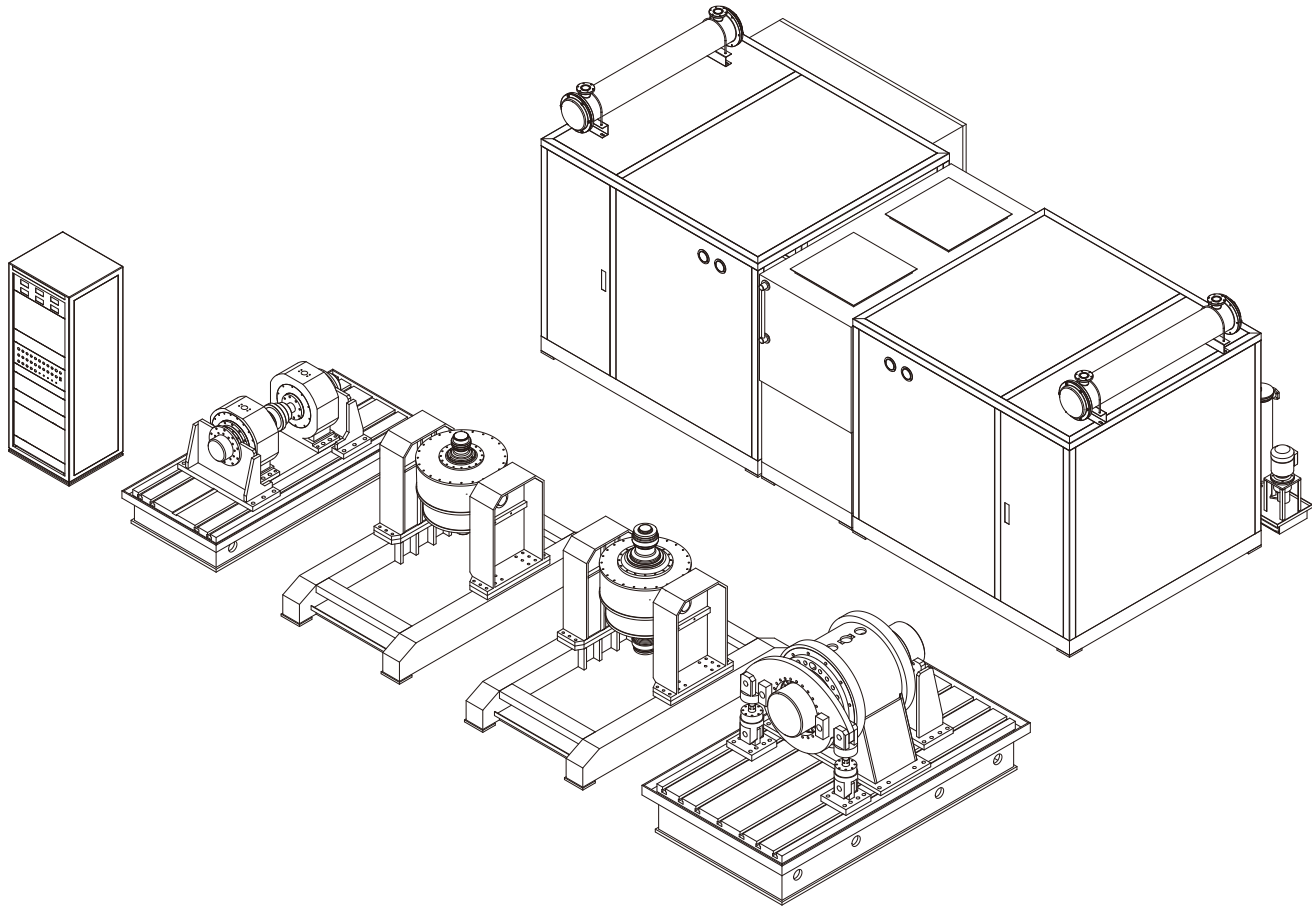
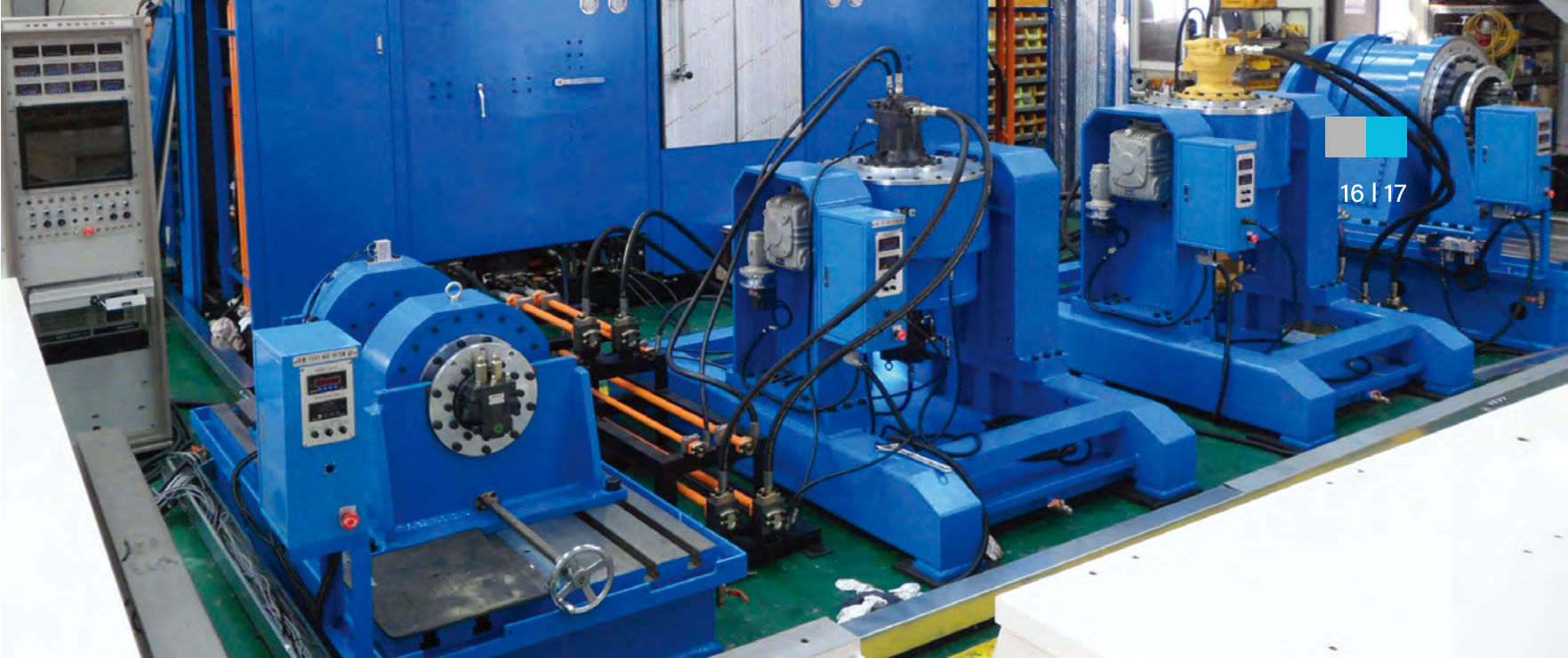
Hydraulic Power	
P1 Pressure	Max. 420 bar
P2 Pressure	Max. 420 bar
P3 Pressure	70 bar
P1 Flow Rate	Max. 300 LPM
P2 Flow Rate	Max. 100 LPM
P3 Flow Rate	27 LPM
Temperature	50±5 °C

Driving Motor Device A	
Torque	Max. 10000 kgf-m
RPM	~ 70 rpm

Driving Motor Device B	
Torque	Max. 1000 kgf-m
RPM	~ 90 rpm

Swing Motor A	
Torque	Max. 200 kgf-m
RPM	~ 1700 rpm

Swing Motor B	
Torque	Max. 100 kgf-m
RPM	~ 2200 rpm







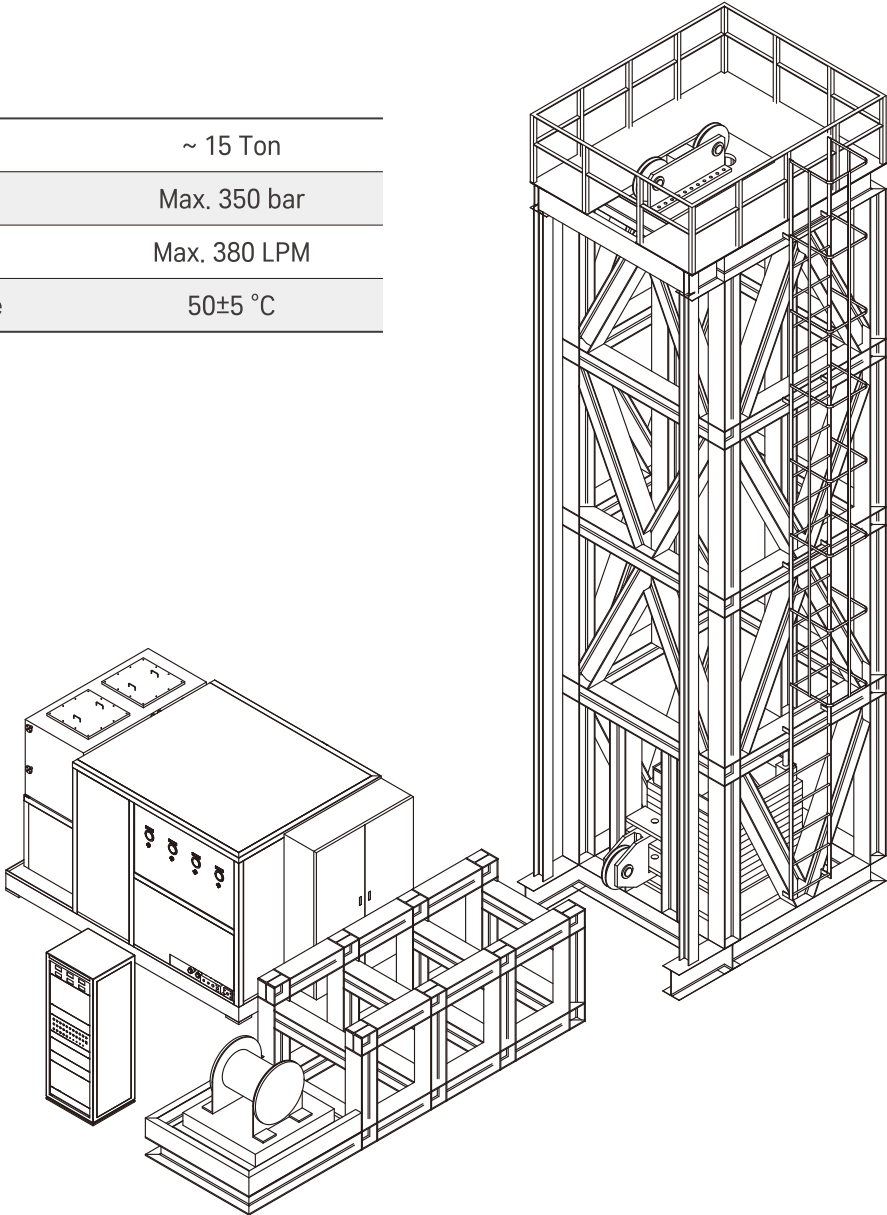
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# ACTUATOR TESTING

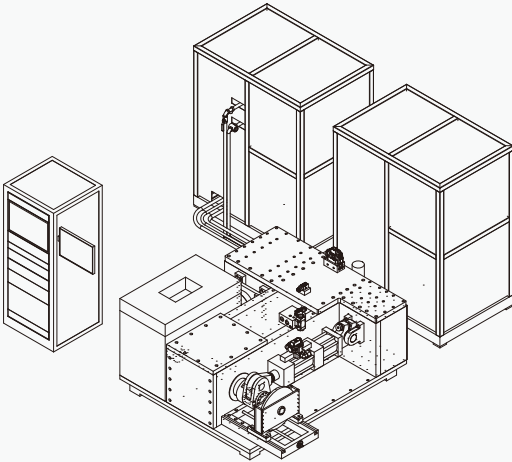
HEAD 의 액추에이터 시험장비는  
다양한 액추에이터의 정적, 동적 성능을 평가합니다.

## Winch Tester

Load	~ 15 Ton
Pressure	Max. 350 bar
Flow Rate	Max. 380 LPM
Temperature	50±5 °C



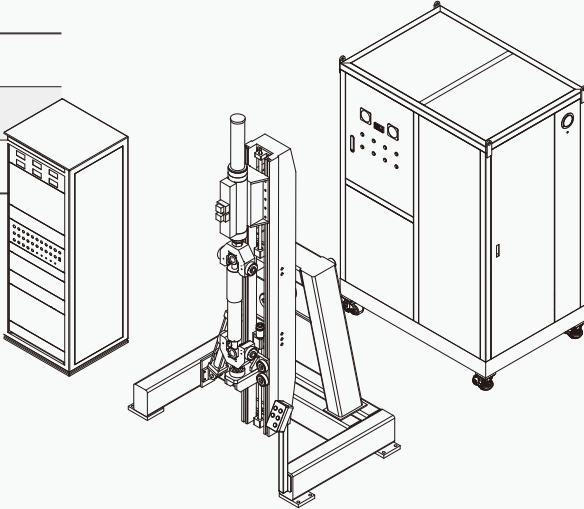
## Cylinder Type Actuator Tester



Test Pressure	210 bar
Load Pressure	275 bar
Test Flow Rate	130 LPM
Load Flow Rate	130 LPM
Temperature	35±5 °C

## Damper Tester

Test Pressure	Max. 200 bar
Test Flow Rate	60 LPM
Temperature	50±5 °C



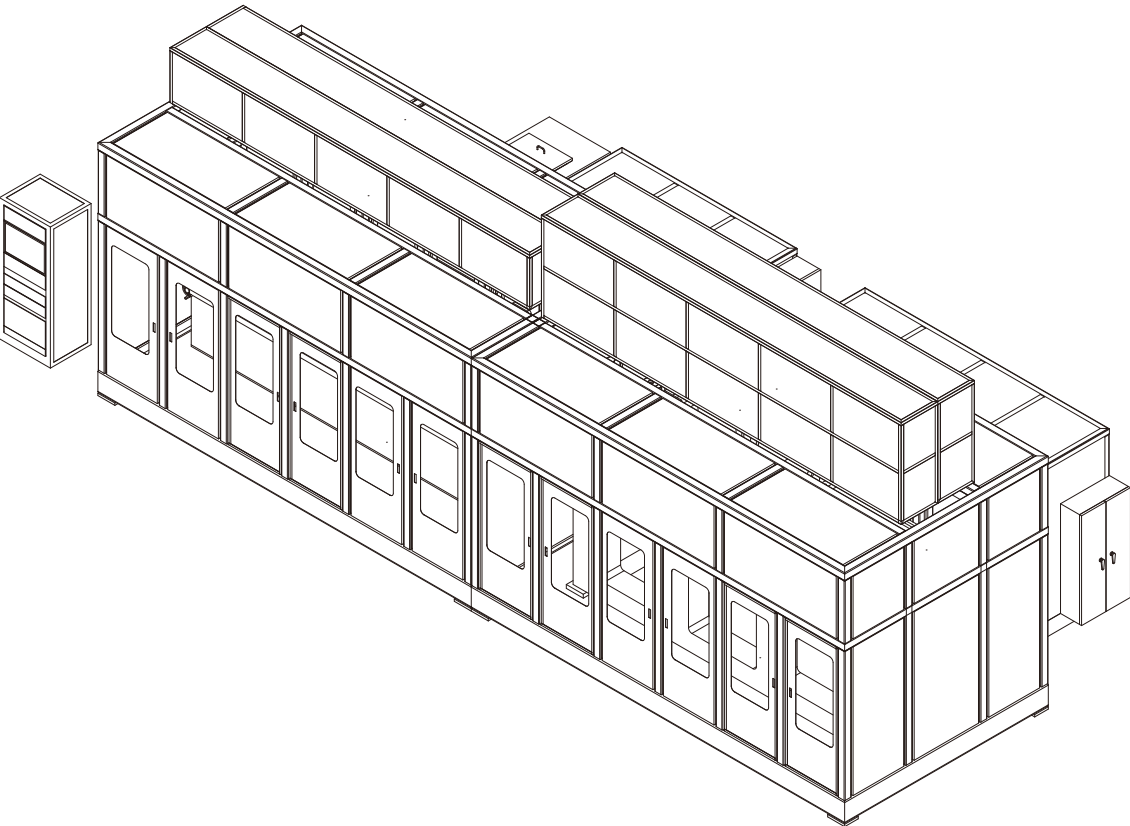




# HYDRAULIC IMPULSE

HEAD의 임펄스 시험장비는 순간적인 유압력을 인가하여 다양한 부품의 성능과 내구성을 평가합니다.

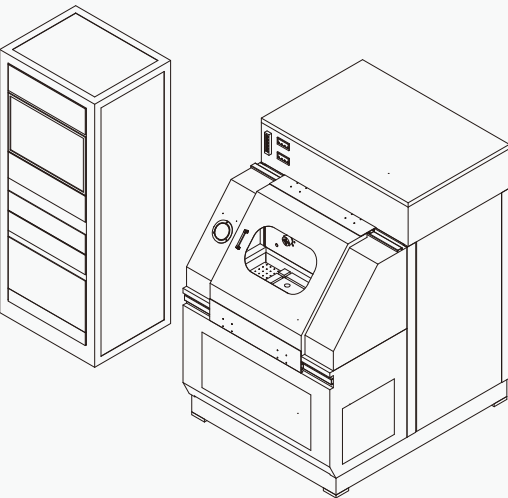
## Hydraulic Hose Tester (Static & Dynamic)



Static		Dynamic	
Test Pressure	50-700 bar	Test Pressure	50-700 bar
Impulse Frequency	~1 Hz	Impulse Frequency	~1 Hz
Temperature	25~150 °C	Rotating R	250 mm
		Temperature	25~150 °C



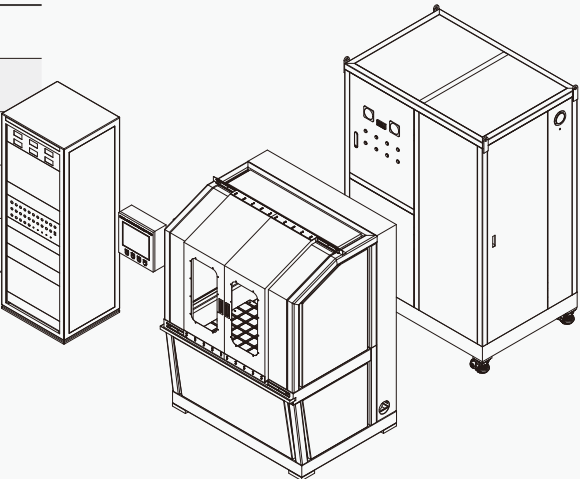
## Hydraulic Pipe, Hose, Valve Impulse Tester (Static)



Impulse Pressure	Max. 700 bar
Flow Capacity	Max. 176cc/Stroke
Temperature	50 ~ 150 °C

## Valve Housing Impulse Tester (Static)

Test Pressure	Max. 450 bar
Pilot Pressure	40 bar
Test Flow Rate	Max. 15 LPM
Pilot Flow Rate	10 LPM
Temperature	50 ~ 150 °C





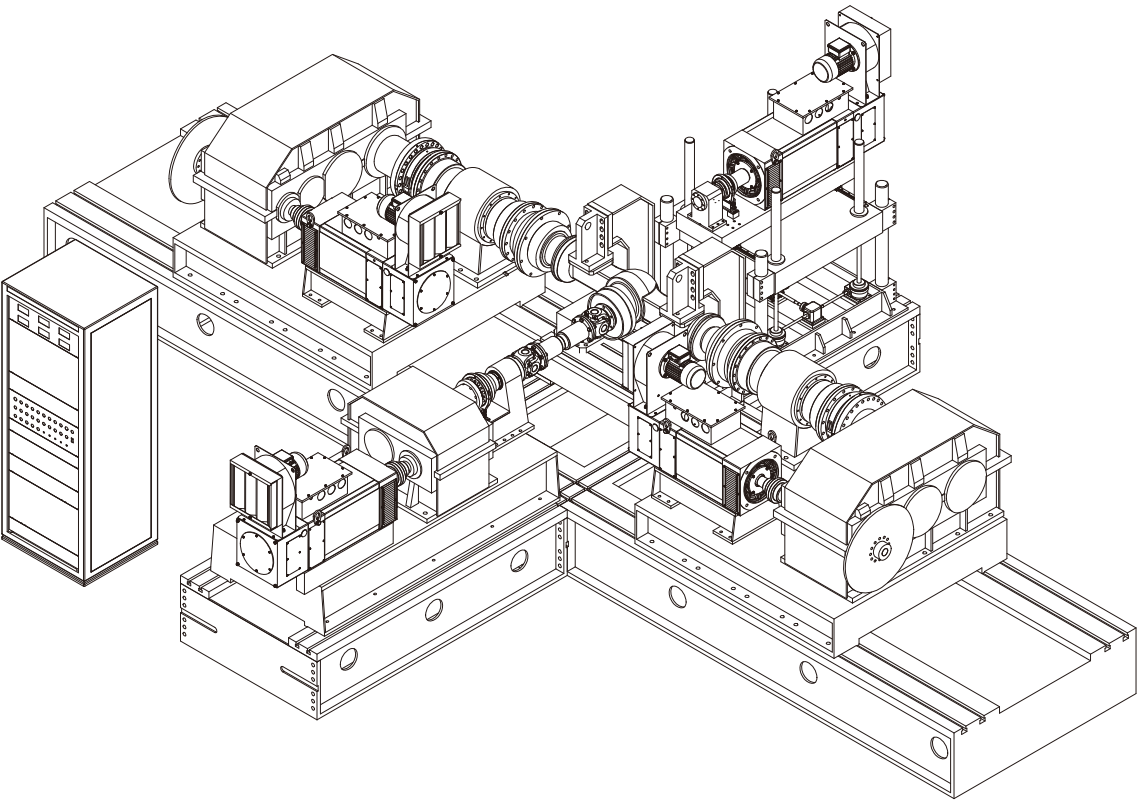


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# DYNAMOMETER

HEAD의 다이나모는 액슬, 트랜스미션, 밸브트레인 등 빠른 속도로 회전하는 기구물의 성능과 내구성을 평가합니다.

## Dynamo For Axle (Load)

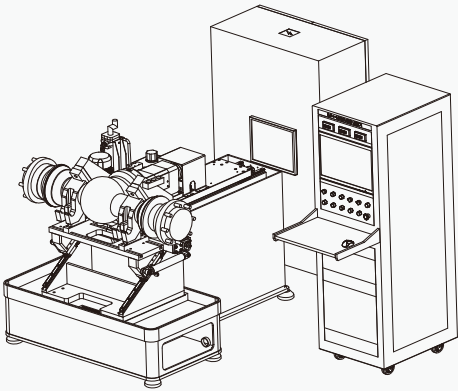


Axle Driving	
Torque	Max. 430 kgf-m
RPM	~ 2400 rpm

Transmission Driving	
Torque	Max. 50 kgf-m
RPM	~ 3000 rpm

Axle Load	
Torque	Max. 5800 kgf-m
RPM	~ 3800 rpm

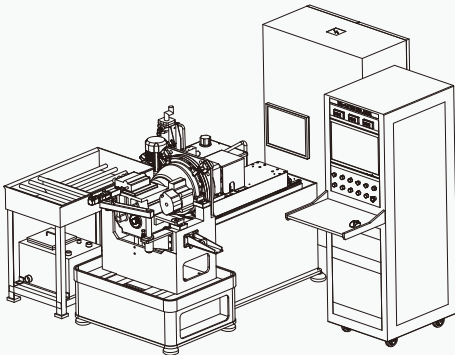
## Dynamo For Axle (No Load)



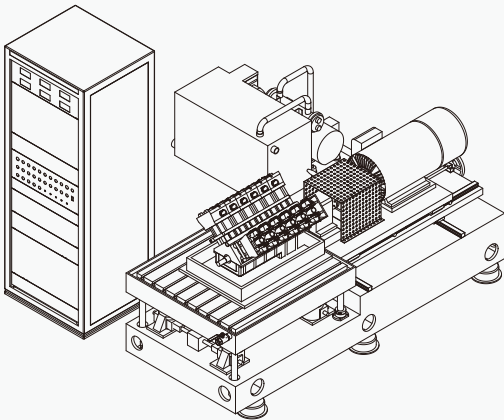
Torque	Max. 9 kgf-m
RPM	~ 3000 rpm
Temperature(Lubrication)	80±5℃

## Dynamo For Transmission (No Load)

Torque	Max. 9 kgf-m
RPM	~ 3000 rpm
Temperature(Lubrication)	80±5℃



## Dynamo For Engine Valve Train



RPM	~ 2000 rpm
Pressure	Max. 5 bar
Flow Rate	Max. 100 LPM
Temperature	30±5 ℃





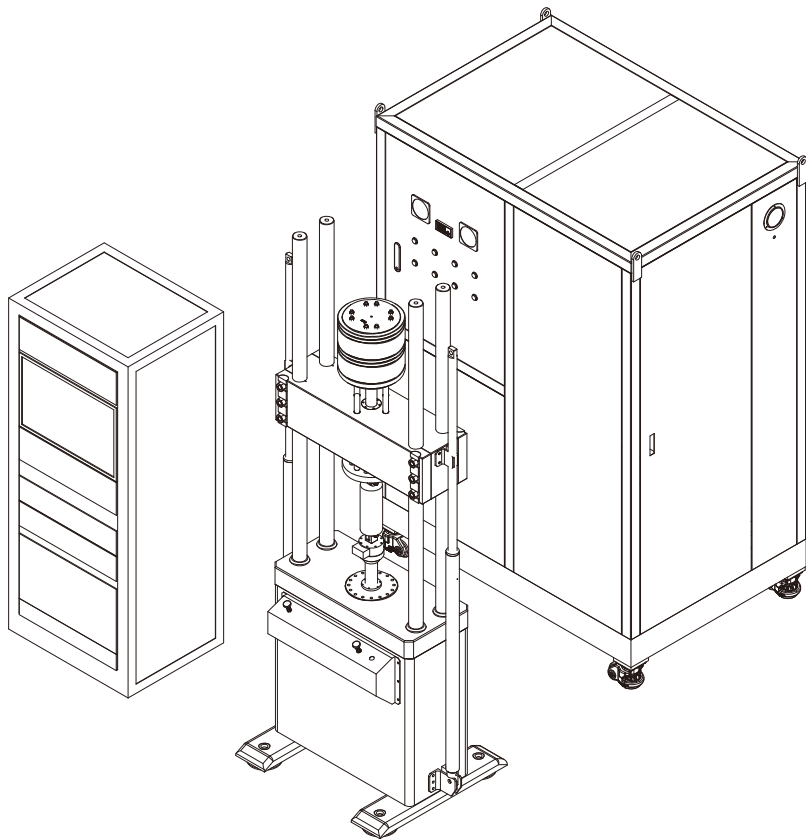


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# TENSION, COMPRESSION AND TORSION

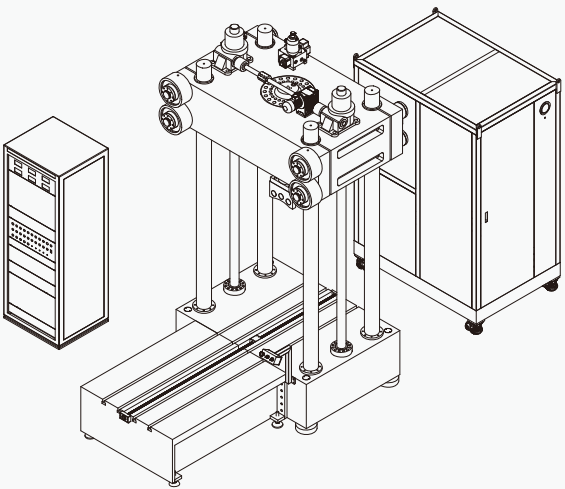
HEAD 의 인장, 압축, 회전 시험장비는  
단일재료에서 복잡한 구조물까지 다양한 기계물성을 평가합니다.

## Universal Type



Pressure	Max. 210 bar
Flow Rate	Max. 100 LPM
Static Force	5 TON
Dynamic Displacement	±50 mm
Velocity	~ 800 mm/sec
DOF	1 DOF (Z axis)

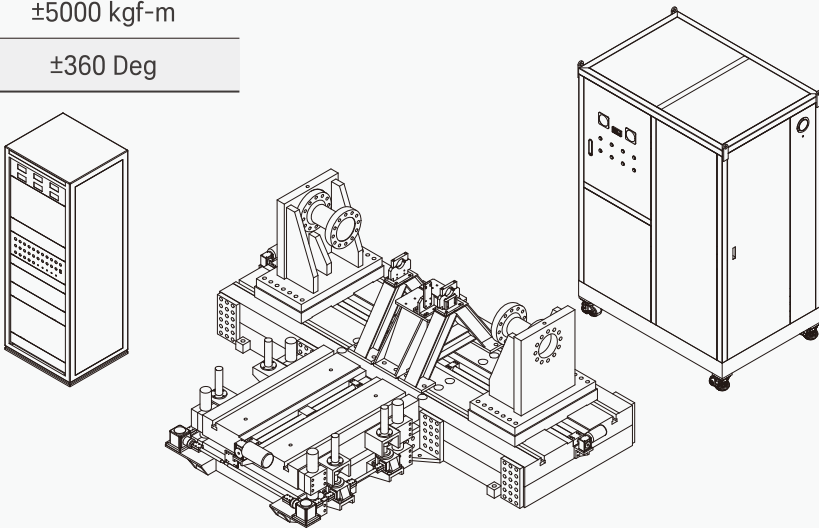
## Ultimate Compression



Pressure	Max. 210 bar
Flow Rate	Max. 60 LPM
Force	20 ~ 100 ton
Displacement	±125 mm

## Torsional Fatigue

Torsion	±5000 kgf-m
Torsion Angle	±360 Deg







# TEMPERATURE AND PRESSURE

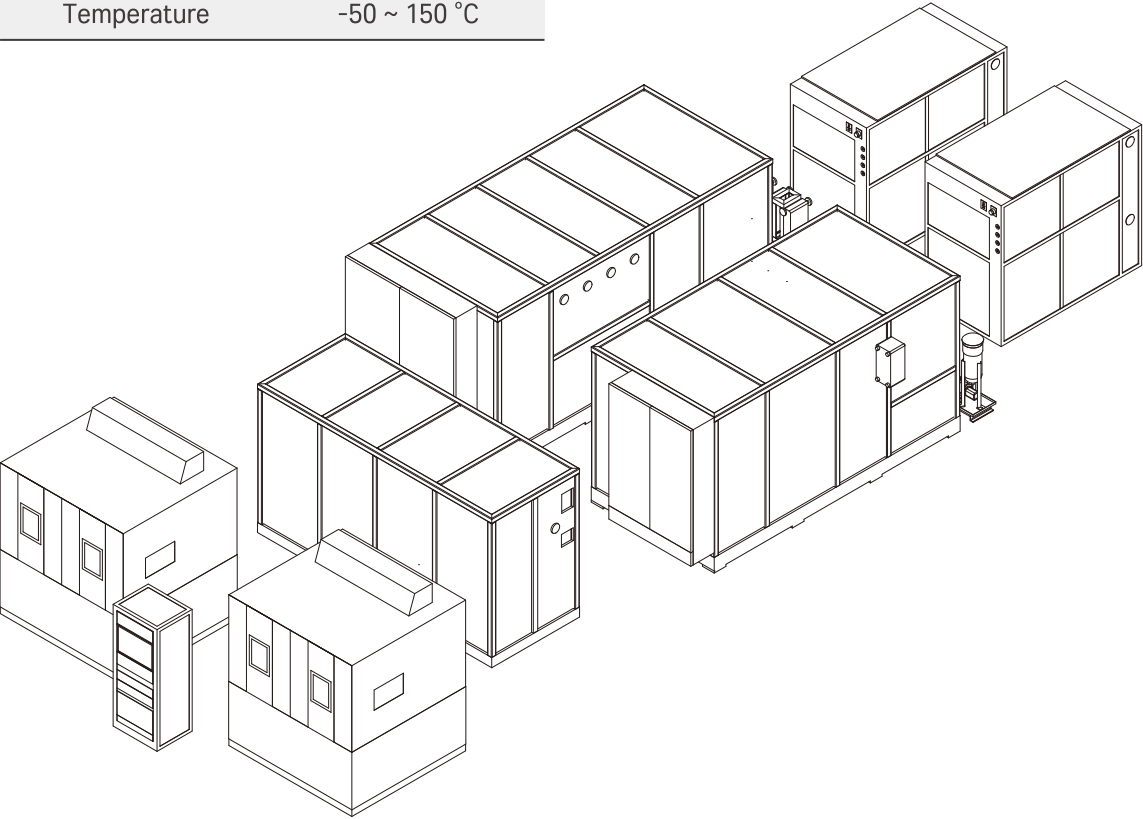
HEAD 의 온도 시험장비는  
고압의 유체환경과 저온/고온의 작동 조건을 동시에 제공합니다.

## Integrated Temperature Tester

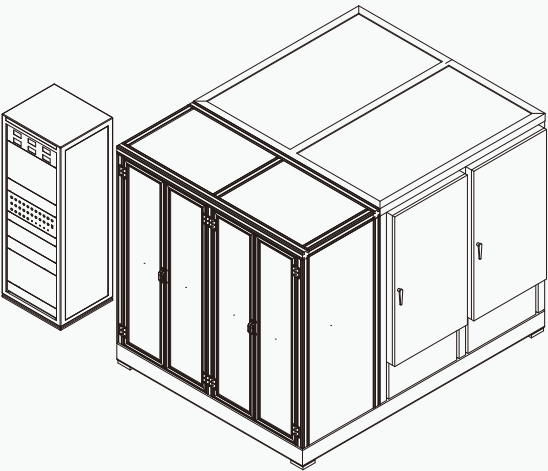
Hot Oil Line		Cold Oil Line	
Pressure	Max. 210 bar	Pressure	Max. 210 bar
Flow Rate	Max. 540 LPM	Flow Rate	Max. 350 LPM
Temperature	25 ~ 135 °C	Temperature	-40 ~ 25 °C

Atmosphere	
Temperature	-50 ~ 150 °C



## Water Pump Seal Temperature Tester



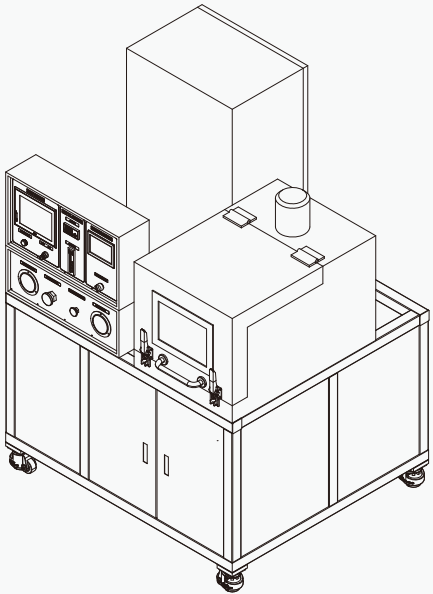
RPM	~ 12000 rpm
Pressure	Max. 6 bar
Flow Rate	Max. 50 LPM
Temperature (Hot)	25 ~ 120 °C
Temperature (Cold)	-40 ~ 25 °C

## Shaft Seal Temperature Tester

Hot Oil Line	
Pressure	Max. 20 bar
Flow Rate	Max. 5 LPM
Temperature	95±5 °C

Atmosphere	
Temperature	-30 ~ 150 °C





## HYDRAULIC POWER UNIT



- 높은 신뢰성과 내구성
- 고정형 / 이동형
- 고온 / 저온 유압유 공급
- 자동 소화시스템

SPECIFICATION	HPXS	HPUS	HPUM	HPUL
Oil reservoir(stainless steel)	~100 LT	~ 300 LT	1000 LT	~2000 LT
Oil Type	Mineral Oil	Mineral Oil	Mineral Oil	Mineral Oil
Pump Type	Gear Pump	Piston Pump	Piston Pump	Piston Pump
Operating Pressure	~250 bar	~250 bar	~420 bar	~420 bar
Flow rate	~30 lpm	~ 100 lpm	~300 lpm	~600 lpm
Flow Control	-	-	○	○
Pressure Control	○	○	○	○
Cleanliness Level	10 micron	10 micron	6 micron	6 micron
Cooling Unit	○	○	○	○
Operating Oil Temp	~ 60 ℃	~ 60 ℃	~ 60 ℃	~ 60 ℃
Oil Temp Control	○	○	○	○
Power Source	AC380V (or AC440V) - 60Hz - 3 ϕ			
Mobile version	○	○	-	-
Hot Oil version	-	Max. 150 ℃	Max. 150 ℃	Max. 150 ℃
Cold Oil version	-	Min. -40 ℃	Min. -40 ℃	Min. -40 ℃

## MAINTENANCE PACKAGE

- HEAD 유지보수 관리표
  - 긴급출동
- 사용자 교육
  - 교정 및 인증서 발급
- 주기 관리 품목 (필터, 실류 등)



SPECIFICATION	BASIC	STANDARD	ADVANCED
Warranty Period	1 Year	1 Year	1 Year
Check List Inspection	○	○	○
Filter Element	○	○	○
Tank Cleaning	-	○	○
Line Flushing	-	○	○
Calibration	○	○	○
Certificate Issuance	-	○	○
Training	-	1 service	3 service
Emergency Calling (within 24H)	-	3 service	10 service
Program Package	-	UI Modification (10)	UI Modification (10) Add Function (5)
Inspection Report	○	○	○



REPAIR, OVERHAUL & REMANUFACTURING



- HEAD 표준 절차 준수
- 사전 검사를 통한 최적 방안 제시
- 현장 / 입고 정비 가능
- 유압, 기구, 전기, 프로그램 자체 전문인력 보유



SPECIFICATION	Repair	Overhaul	Remanufacturing
Warranty Period	-	6 Month	1 Year
Pre-Inspection	○	○	○
Pre-Inspection Report	-	○	○
Post-Inspection	○	○	○
Post-Inspection Report	○	○	○
Redesign	-	-	○
Cleaning	○	○	○
Parts Replacement (Proceed As Needed)	○	○	○
Function Testing	○	○	○
Performance Testing	-	○	○
Testing Report	○	○	○

HEAD 표준 절차



기대효과

