

Joint-Use facilities and equipment List

May 2018

Arid Land Research Center (ALRC), Tottori University

○Arid-tron Control and Experimental Building

(Chemical analysis laboratory)

Installation year	Equipment number	Name	Company & Model
0 2 . 8	L 006-15	Water Purifying Apparatus	YAMATO WG262

(Laboratory)

Installation year	Equipment number	Name	Company & Model
0 2 . 8	L 008-36	System for Analyzing Responses of Dryland Plants in Dry Lands	KOITO Industries, Ltd · Chamber [above-ground part] (3) · Soil Temperature Regulation System [underground part] (3)
9 7 . 3	L 009-212-4	Automatic Leaf-area Planimeter	HAYASHI DENKO AAC-410
0 5 . 1 1	105-9087	Automatic Leaf-area Planimeter	HAYASHI DENKO AAC-410
0 2 . 8	㊦ 003-100	Electric Balance	SARTORIUS LA12000S
0 2 . 8	㊦ 003-101	Electric Balance	SARTORIUS LA12000S
0 2 . 8	㊦ 003-102	Electric Balance	SARTORIUS LA12000S

(Import soil treatment and store room)

Installation year	Equipment number	Name	Company & Model
9 7 . 3	L009-213	Autoclave (For Soil)	YAMATO SP32

(Field instruments storage 1)

Installation year	Equipment number	Name	Company & Model
9 8 . 3	L 008-20-1	Monitoring and Analyzing System for Plant Responses to Salinity Stress · Quantum Monitoring System	LICOR Quantum Sensor LI-190, Spherical Underwater Quantum Sensor LI-193, Data Logger LI-1000
1 1 . 3		Canopy Monitoring System	
	105-21930, 21931	· Data Logger · Pyrgeometer · Compact Quantum Sensor · Tripod	CAMPBELL CR1000-4M-XT (2) CLIMA-TEQ CHF-NR01 (2) LICOR LI-190SL (2) CAMPBELL CM10 (2)
1 1 . 3	105-21928, 21929	SunScan System	DELTA-T EM-SUNSCAN-SS1-R3-BF3 (2)
1 3 . 1 0		System for Underground Hydrology (Subsurface Hydrology)	
	105-27287	· Ground Water Level Monitoring System	OLIE WH-1000 (5), WH-500 (5) IN-SITU Inc. Level TROLL500 3.5m; cable 11m (5), Level TROLL500 3.5m; cable 21m (5), Level TROLL500 21m; cable 70m (2), Level TROLL500 70m; cable 70m (1), Rugged Reader

(Field instruments storage 1)

Installation year	Equipment number	Name	Company & Model
0 5 . 8		Ventilation Thermometer/ Hygrometer	VAISALA HMP45A
0 5 . 8		Ventilation Thermometer/ Hygrometer	VAISALA HMP45A
0 5 . 8		Ventilation Thermometer/ Hygrometer	VAISALA HMP45A
0 8 . 3		Rain Gauge	CLIMA-TEQ CYG52202
0 8 . 3		Rain Gauge	CLIMA-TEQ CYG52202
0 8 . 2	105-13802	Pyranometer/ Pyrgeometer	KIPP&ZONEN CPR-CNR
0 9 . 8	105-17362	Weather Station	DELTA-T WS-GP1
0 2 . 8	Q 002-1053	Data Logger	LICOR LI1400
0 3 . 1	Q 002-1081	Micro Data Logger	CAMPBELL CR23X-1M
0 5 . 8	105-8978	Micro Data Logger	CAMPBELL CR10X -2M-XT
0 5 . 8	105-8979	Micro Data Logger	CAMPBELL CR10X -2M-XT
0 8 . 2	105-14031	Micro Data Logger	CAMPBELL CR3000-3M-XT
0 5 . 8	105-8978	Relay Multiplexer	CAMPBELL AM16/32
0 5 . 8	105-8979	Relay Multiplexer	CAMPBELL AM16/32
0 8 . 3	105-14390	Storage Module	CAMPBELL SM16M
0 8 . 3	105-14031	Storage Module	CAMPBELL CFM100
0 6 . 1 2	105-11285	GPS	TIMBERTEC
1 0 . 2	105-18748	Portable GPS	GARMIN Oregon300
1 0 . 2	105-18749	Portable GPS	GARMIN Oregon300
1 0 . 8		Portable GPS	GARMIN eTrex Venture HC (5)
0 8 . 3	105-14056	Vacuum Pump Unit	BUCHI V-712
1 1 . 3	105-22469	Vacuum Pump Unit	BUCHI V-702
0 2 .	は 999-128	pH meter	HORIBA D-23
0 2 .		Soil Hardness Meter	DAIKI RIKA DIK-5553
0 2 .	L 007-146	WET sensor	DELTA-T WET1
0 8 . 3	105-16004	Soil Moisture Meter	DELTA-T PR2/6
0 2 . 8	S 999-127	Soil Moisture Meter Reader	DELTA-T HH2
0 9 . 3	105-16004	Soil Moisture Meter Reader	DELTA-T HH2
1 0 . 3	105-18776	Root Scanning System	CID CI-600

(Field instruments storage 2)

Installation year	Equipment number	Name	Company & Model
1 3 . 1 0		System for Underground Hydrology (Subsurface Hydrology)	
	105-27288	• Underground Structure Surveying System • Multi-channel Electricity Surveying Device	IRIS Instruments SYSCAL Pro Switch48、 RES2DINV、 RES3DINV Geophysical Survey Systems INC. FGUTILSCAN2A/643 (SIR-3000、 270MHz Antenna) 35MHz Antenna SUBECHO-40、 RADAN7 DELTA-T PR2/4 (2)、 PR2/6 (2)、 DL6 (2)、 HH2 (2)、 WET2
	105-27289	• Underground radar	
	105-27290	• Soil Moisture System	
1 3 . 1 2	105-27514	Electromagnetic Surveying Device	GSSI EMP-400

(Basement)

Installation year	Equipment number	Name	Company & Model
9 7 . 3	L 009-213	Constant Temperature Oven (For Soil)	YAMATO DK810
9 7 . 3	L 009-213	Electric Balance	METTLER KCC150S
9 9 . 8	L 007-131	Micro-mini High Pressure Air Compressor (air-cooled-type)	TOKYO SENSUIKI
0 4 . 1 2	105-7349	Electric Oven	YAMATO FO810

○Growth Chamber Experimental Building**(Growth chamber laboratory)**

Installation year	Equipment number	Name	Company & Model
1 6 . 3		Experimental System for Analyzing Responses of Dryland plants to Climate Changes	
			ESPEC MIC (2) Temp.: 5~50°C (lightning), 5~50°C (lights-out) Humid.: 5~70%(lightning), 5~90% (lights-out, under 40 °C) Max Illuminance; PPF1,500 μ mol/m ² /s CO ₂ cont.: Max 1,200ppm Turn table; Max 8 pots(1/5000a) Chamber size; W1,800×D1,800×H2,500
0 3 . 3	L 007-158,159	Personal Growth Chamber	KOITO Industries, Ltd. HNM-S-10

(Biochemical laboratory)

Installation year	Equipment number	Name	Company & Model
1 0 . 2		Electron Micro-Analyzer	
	105-18625	• Environmental Scanning Electron Microscope (Electron beam observation system)	FEI Quanta250
	105-18626	• Scanning Electron Microscope	JEOL JSM-6610LV
9 6 . 3	105-11707	• Energy Dispersive X-ray diffraction equipment	EDAX DX4
9 7 . 3			EDAX Genesis XM2
0 6 . 3			
0 5 . 2	105-7547	High Speed Refrigerated Centrifuge	KUBOTA 7780
0 5 . 2	105-7536	Isothermal Bio Shaker	TAITEC BR-42FL·SR
0 5 . 2	105-7545	Fluorescence Microscope	OLIMPUS BX51
	105-7546		
0 8 . 3	105-14553	Stereo Microscope	OLIMPUS SZX7-ILST-C、
	105-14554		
0 5 . 2	105-7544	Cell Homogenizer	BIO MEDICAL SCIENCE BMS-12
0 5 . 2	105-7535	Incubator	SANYO MLR-350HT
0 5 . 2	105-7539	Incubator	SANYO MLR-350HT
0 5 . 2	105-7540	Incubator	SANYO MLR-350HT

○Growth Chamber Experimental Building 2

Installation year	Equipment number	Name	Company & Model
06. 2		Illuminometer	MINOLTA T-10
09. 3		Dryland Simulation System	
10. 3	105-16040 105-16040-1 105-16041	• Sub-tropical Simulator	ESPEC MIC (3) Temp.: 5~50°C (lightning, over 50,000lx), 0~50°C (lightning, under 50,000lx or lights-out) Humid.; over 10 °C 5~70% (lightning), 5~90% (lights-out) Max Illuminance 130,000lx (PPFD 1,800 μ mol/m ² /s) Red, Green, Blue lights each PPFD 0~600 μ mol/m ² /s CO ₂ cont. (only #3) Max 1,200ppm Chamber size W1,700× D2,600×H 2,000
	105-16042 105-16043 105-16044	• Cold Simulator	ESPEC MIC (3) Temp.:5~30°C (lightning over 50,000lx), -15~30°C (lightning under 50,000lx or lights-out) Humid.; (over 5 °C) 20~70% (lightning), 20~90% (lights-out) Max Illuminance 120,000lx (PPFD1,500 μ mol/m ² /s) CO ₂ cont.; Max 1,200ppm Chamber size 1,700× 2,600× H2,000
	105-16046 105-16046-1	• Evapotranspiration measuring instrument with soil temperature control function	ESPEC MIC (4)

○Main Building

(Joint-use Laboratory for Biology)

Installation year	Equipment number	Name	Company & Model
17. 3	105-34199	Comprehensive Analysis System for Plant Responses	
		• Inductively Coupled Plasma Mass Spectrometer	Agilent 8900 Triple quadrupole ICP-MS System
		• Liquid Chromatograph Mass Spectrometer	Agilent 6420 Triple quadrupole LC/CE-MS System
		• Micro Ultra Centrifuge	HITACHI CS150FNX
		• Centrifugal Concentrator	THERMO FISHER SpeedVac SPD131DDA
		• Cryogenic Freezer	Panasonic MDF-DU500VH-PJ
		• Hybrid High Speed Refrigerated Concentrator	KUBOTA 6200
17. 3	105-34188	• Multi Beads Shocker	YASUI KIKAI
17. 3	105-34092	• Microwave Ashing System	Milestone General K.K. ETHOS UP
10. 3	105-18849	Stable-Isotope Ratio Mass Spectrometer System	
		• Stable-Isotope Ratio Mass Spectrometer	THERMO FISHER DELTA V Advantage GasBench II, Flash2000
11. 10	105-23091	Micro Electric Balance	SARTORIUS MSU6.6-000-DM

(Joint-use Laboratory for Biology)

Installation year	Equipment number	Name	Company & Model
17.10		Draft Chamber	DALTON DFC51
98.3	L 008-21	Analytical Balance	SHIMADZU AG245
03.1	S 004-147	Medical Freezer	SANYO MDF-U537D
18.3		Bio Refrigerator	PANASONIC MPR-312DCN-PJ
06.3	401-126	EC meter	DKK-TOA's CM-30R
10.12	105-15887	pH meter	DKK-TOA's MM-60R
06.		Ultra Sonic Washing Machine	AS ONE USD-2R
08.2	105-13876	Ice Maker	HOSHIZAKI FM-120F
08.2	105-13824	CN coder	J-SCIENCE JM1000CN
13.		Acid-resistance Hot Plate	ASAHI RIKA ABS-500
14.3	105-28202	Water Purifying Apparatus	MERC MILLIPORE Elix Essential 10 (UV)
14.8	105-29240	Ultra Water Purifying Apparatus	MERC MILLIPORE Milli-Q Reference

○International Joint Research Building

(Laboratory for joint-use researchers 2)

Installation year	Equipment number	Name	Company & Model
09.3	105-16039	Root-Soil Monitoring System	CID Bio-Science, Inc. CI-600 Regent Instruments Inc. WinRhizo
03.3	L 009-293	Visible-ultraviolet Spectrophotometer	JASCO Corporation V-560
08.3	105 - 14093,14094,14 095,14617,1461 8,14619 L008-20-2-4-2,3, 5,6,8,11,13	HPLC System	SHIMADZU LC-20AB, LC-10ATvp, RF-10A
06.2		Illuminometer	MINOLTA T-10
02.8	L 009-260	Water Potential Measuring Equipment	PMS Model 1000
06.12	105-11286	Water Potential Measuring Equipment	PMS Model 1000
02.8	L008-36-2,4	Portable Photosynthesis System	LICOR LI6400 #.2
02.8	L008-36-3,5	Portable Photosynthesis System	LICOR LI6400 #.3
03.12	L009-356	Portable Photosynthesis System	LICOR LI6400 #.4
09.03	105-16032	Portable Photosynthesis System	LICOR LI6400 #.5
10.03	105-18865	Portable Photosynthesis System	LICOR LI6400 #.6
17.3	105-34199	Portable Photosynthesis System	LICOR LI6800F/TK16 #.7
17.3	105-34194	Portable Photosynthesis System	LICOR LI6800F/TK16 #.8
09.03	105-16005	Field Portable Photosynthesis System	ADC BIOSCIENTIFIC LCpro+
09.03	105-16006	Field Portable Photosynthesis System	ADC BIOSCIENTIFIC LCpro+
09.03	105-16007	Field Portable Photosynthesis System	ADC BIOSCIENTIFIC LCpro+

(Laboratory for joint-use researchers 2)

Installation year	Equipment number	Name	Company & Model
06.12	105-11289	Leaf Porometer	DECAGON SC-1
09.03	105-16003	Porometer	DELTA-T AP4
09.07	105-17256	Porometer	DELTA-T AP4
09.	105-17356	Porometer	DELTA-T AP4
09.03	105-16002	Photosynthesis Yield Analyzer	WALZ MINI-PAM
10.03	105-18961	Photosynthesis Yield Analyzer	WALZ MINI-PAM
08.10	105-15281	Thermo-tracer	NEC AVIO TH9100WR
17.3	105-34199	Thermo-tracer	NIPPON AVIONICS CO.,LTD R500EX-Pro
90.3	105-999-103	Portable Planimeter	LI-COR LI3000A

(Laboratory for joint-use researchers 1)

Installation year	Equipment number	Name	Company & Model
98.12	L008-24	Gas Chromatography	SHIMADZU GC-17AATFV3
09.3	105-15980	Atomic Absorption Spectrometer	SHIMADZU AA6800F + GFA-EX7
12.12	105-25653	Acid-resistance Hot Plate	ASAHI RIKA ABS-500
15.3	105-30331	Draft Chamber	YAMATO RFS-120S-JZ

○International Arid Laboratory Building

(Biohazard Greenhouse)

Installation year	Equipment number	Name	Company & Model
11.3	105-18846	Harvesting Light Unit	KOITO Industries LG3420
11.3	105-18847	Harvesting Light Unit	KOITO Industries LG3420
11.3	105-18848	Harvesting Light Unit	KOITO Industries LG3420
11.3		Gardening Shelf (14)	

(Gene-recombination laboratory)

Installation year	Equipment number	Name	Company & Model
05.2		Plant Molecular Response Analysis System	
	105-7543	• Real-time PCR System	ROCHE LightCycler2.0
	105-8260	• Hybridization Oven	TAITEC HB-80
		• Water Bath	TAITEC ThermoMinder50
		• Hot Block Bath	TAITEC DTU-1B
12.12		DNA Sequencer for Soil Microorganisms	
	105-25621	• DNA Sequencer	LIFE TECHNOLOGIES IonPGM System, E-Gel SizeSelect, Qubit 2.0 Fluorometer
	105-25623	• Microchip Electrophoresis apparatus	AGILENT TECHNOLOGIES Agilent2100 Bio-analyzer
	105-25624	• Micro Spectrophotometer	THERMO FISHER NanoDrop ND-2000c

(Gene-recombination laboratory)

Installation year	Equipment number	Name	Company & Model
1 7 . 3	L 002-3	Autoclave	HIRAYAMA HVE-50LB
9 6 . 3	L 008-19-2	Centrifugal Evaporator	EYELA CVE-200D
9 6 . 3	L 008-19-2	Incubator	EYELA SLI-1000ND
-	-	Gel Imager	ATTO AE-6932GXCF
9 6 . 3	L 001-10-3	Ice maker	HOSHIZAKI FM-120D
9 6 . 3	は 003-86	Chemical Balance	METTLER PG602
9 8 . 3	L 008-22	Analytical Balance	SHIMADZU AB104
0 3 . 7	L 001-39	Micro High Speed Cooling Centrifuge	HITACHI CF15R
9 7 . 3	L 009-211-3	Safety Cabinet	HITACHI SCV-1903EC II A
9 8 . 1	L 007-117	Isothermal Shaker	TAITEC BR-30
0 5 . 2	105-7537	Isothermal Bio Shaker	TAITEC BR-42FL-SR
0 8 . 2	105-13843	Constant Temperature Dryer	YAMATO DX402
0 9 . 6	105-17069	Bio Refrigerator	NIHON FREEZER BMS-350F3
0 9 . 3	105-16000	Imager	FUJI FILM LAS4000EPUVmini-TU
1 3 . 2	105-26108	Ultra Water Purifying Apparatus	MERC MILLIPORE Direct Q-3UV
1 3 . 3	105-26180	Micro Plate Reader	CORONA Electric SH-9000Lab
1 4 . 1	105-27759	Real-time PCR System	Agilent Technologies StepOnePlus-01VP02CP
1 5 . 7	105-31013	Thermal Cycler	BIO-RAD T100
1 6 . 3	105-32270	Cryogenic Freezer	PANASONIC MDF-DU300H
1 6 . 3	105-32212	Freezer	PANASONIC MDF-U538D-PJ

(Genetic Resources Storage)

Installation year	Equipment number	Name	Company & Model
1 0 . 2	105-19149	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-19150	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-19151	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-19152	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-19153	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-19154	Cultivating Shelf	IKEDA RIKA AV152261-12-3
1 0 . 2	105-18349	Bio Freezer	NIHON Freezer GS-5210HC

(Sterilizing Room)

Installation year	Equipment number	Name	Company & Model
1 1 . 3	105-21936	Freeze Dryer	TAITEC VD-550R

(Yellow Dust Observation Laboratory)

Installation year	Equipment number	Name	Company & Model
00.11 03.3 02.2		Geographical Information System Satellite Image Analyzing System	ArcView3.2 ArcGIS10 (5 licenses) ERDAS IMAGINE2010 (3 licenses) ERDAS LPS (1 licenses)
12.3		Monitoring System for Yellow Sand Occurrence in East Asia	
	105-24372 23898 105-23900		CLIMA-TEQ VISION TECH
12.12		DNA Sequencer for Soil Microorganisms	
	105-25622	• Sequence Data Analyzing System	DNASTAR SeqMan NGen, ArrayStar 5, Lasergene 10 Core Suite

(Environmental Restoration Laboratory)

Installation year	Equipment number	Name	Company & Model
03.1	S999-139	Drying Oven	AS ONE DO-600FPA
98.3	L 008-20	Constant Temperature Dryer	YAMATO DN910
98.3	L 008-20	Water Purifying Apparatus	YAMATO WA730
01.10	L 007-143	Soil Shaker	DAIKI RIKA DIK-2102
		Soil Disintegrator	KANSO Industry RC100A
99.2	L 999-9	Soil Disintegrator	HOKUETSU AS-7-5
		Dispersion mixer	MARUTO Testing Machine Company S13-A-2

(Reading Room)

Installation year	Equipment number	Name	Company & Model
02.2	Q002-1007	Scanner	EPSON ES-8500
03.12	Q002-1169	Large-sized Printer	EPSON PX-9000
10.3	105-19122	Large-sized Printer	EPSON PX-9550

**○Arid Dome Laboratory Building
(Central Dome)**

Installation year	Equipment number	Name	Company & Model
97.3	L 009-213	Monitoring System for Water and Solute Transport	
04.6 17.3		Weighing Lysimeters Controlling Water table (3)	YAMATAKE HONEYWELL
01.3	L 008-31	Wind Tunnels for Analysis of Desertification Mechanism (4)	IHI
97.8	L 009-215	Three Dimensional Erosion Analysis System	
		• Rainfall Simulation System	SANKEI RIKA

(Data Storage)

Installation year	Equipment number	Name	Company & Model
08.10	105-15219	Compact Oil Expressing apparatus	SAN SEIKI K-15T

(Exhibition Room 1)

Installation year	Equipment number	Name	Company & Model
98.3	S999-89	Specimen Exhibition System 1 set	
05.9	105-9001 ~9004	• Arid Land Georama System	
05.12	105-13333 ~13334	• Arid Land Visual Data System	
07.2	105-7604		
05.2		• Desertification Process Interpretation System	
06.3	105-10061	• Agricultural and Revegetation Techniques in Arid Regions interpretation System	
06.3	105-10062	• Specimen Exhibition System	

○Crop Growing Field

Installation year	Equipment number	Name	Company & Model
97.3	L009-213	Monitoring System for Water and Solute Transport	
98.10		Weighing Lysimeters (4)	YAMATAKE HONEYWELL
99.8			
00.2			
17.3			
01.3 /09.3 /14.12	Q001-1013 105-16031	Meteorological Equipment	OGASAWARA KEIKI Seisakusho Co., Ltd.
94.3		Weighing Lysimeter (4)	SHIMADZU

○Heavy-duty trucks and field tools

Installation year	Equipment number	Name	Company & Model
	D001-1	Backhoe	YANMAR B37-1
	F003-2	Tractor	KUBOTA M6950DT
	104-143	Tractor	KUBOTA GM73QBSMAXLIP
	F003-4	Tractor	KUBOTA GL-35FQ/BMAXSP
08.3	104-175	Tractor	MITSUBISHI GF150
05.3	105-8205	Power Tiller	ISEKI NR602RT
10.3	104-213	Wood Chipper	KIORITZ KCM121DX
08.1	104-170	Mower	KIORITZ RMK161
10.2	105-19118	Conveyor	KEIBUN LC-335
10.2	105-19117	Conveyor	KEIBUN LC-535
	104-148	Snow Blower	KUBOTA KSR11RS 1
11.1	104-222	Snow Blower	MITSUBISHI MSR1017S