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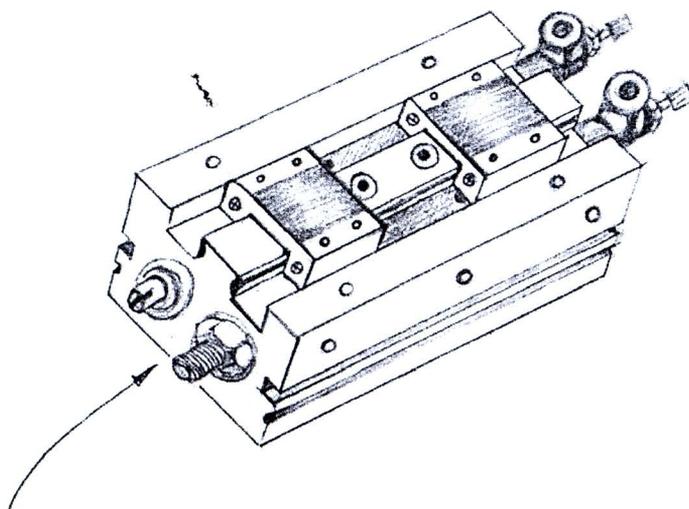
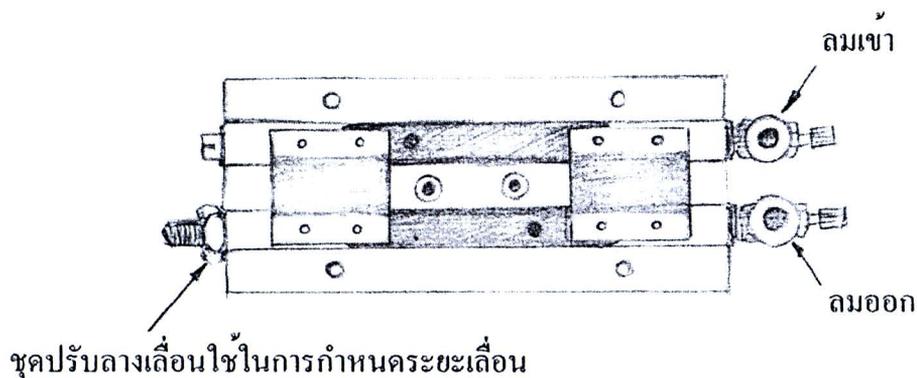
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ภาคผนวก

ภาคผนวก ก
อุปกรณ์สำหรับระบบแรงลม

ภาคผนวก ก
อุปกรณ์สำหรับระบบแรงลม

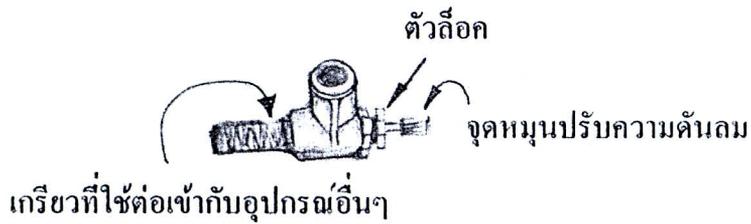
กระบอกลูกสูบแบบไดอะแฟรม



หลักการในการทำงาน

เมื่อลมเข้าก็จะทำให้กระบอกลูกสูบสามารถเลื่อนเข้าเลื่อนออกได้ตามความต้องการ โดยมี วาล์วเป็นตัวควบคุมลมอีกทีหนึ่ง
กระบอกลูกสูบชนิดนี้ใช้ในงานอุตสาหกรรมที่ต้องการความละเอียดมากๆ

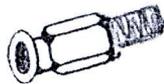
ข้อต่อลมแบบมีวาล์วควบคุมอัตราการไหลในตัว



หลักการในการทำงาน

ใช้ในการปรับแรงดันลมอย่างง่ายและสะดวกมาก
 เพราะอุปกรณ์มีความกระชับ จึงสะดวกต่อการใช้งาน
 และยังมีตัวลิ้นเพื่อให้ระดับลมเท่ากันตลอด

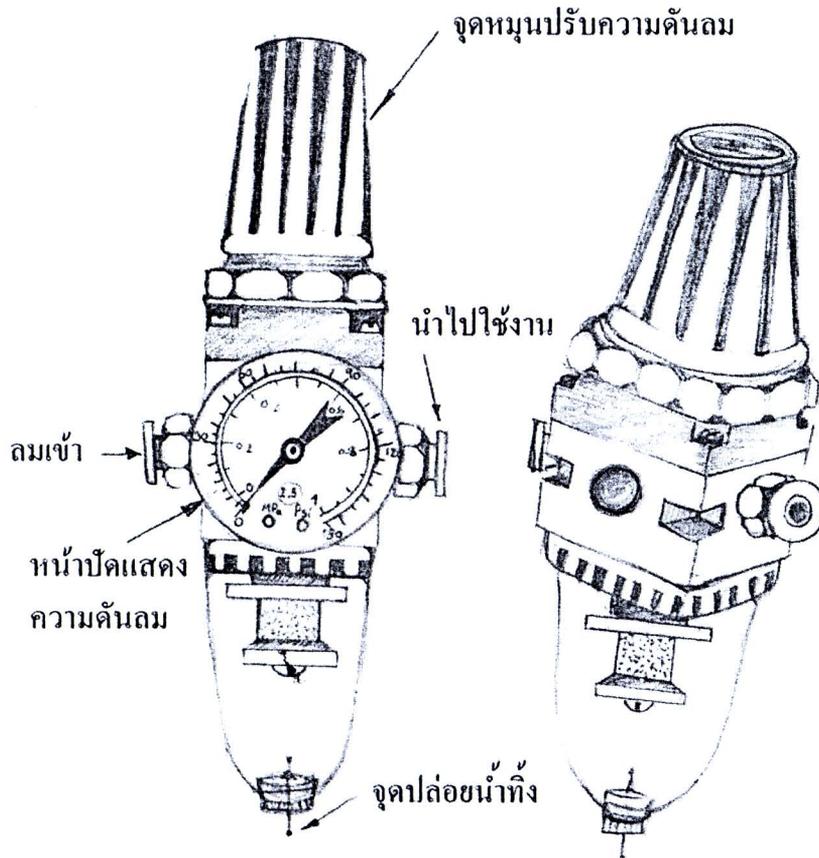
ข้อต่อลม



หลักการในการทำงาน

ใช้เป็นข้อต่อลมในการต่อลมเข้ากับอุปกรณ์ต่างๆในระบบ

อุปกรณ์ควบคุมความดันลม

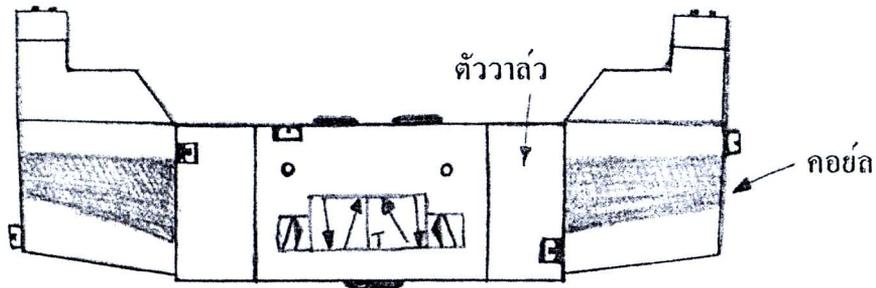


หลักการในการทำงาน

ใช้ในการลดความดันลมหรือเพิ่มความดันลมในระบบเพื่อให้ได้แรงดันลมที่ต้องการจะนำไปใช้ โดยมีหน้าปัดแสดงความดันลมที่ด้านหน้า



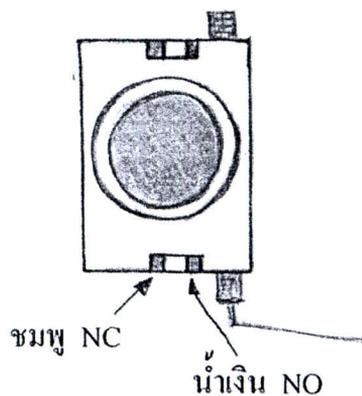
วาล์ว 5/2 2คอยล์



หลักการในการทำงาน

ใช้ควบคุมกระแสลมในระบบ โดยการใช้คอยล์เป็นตัวควบคุมอีกทีหนึ่ง โดยการให้ไฟฟ้าเข้ามาช่วย

ปุ่มกดแบบ Manual

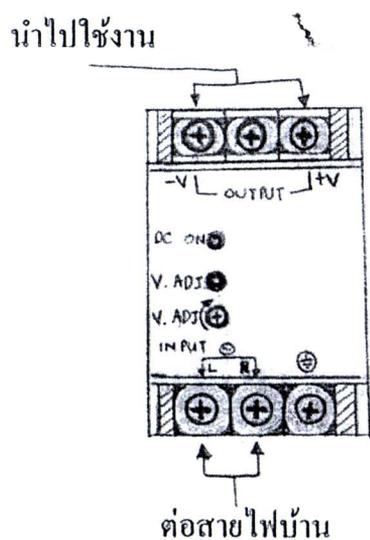


หลักการในการทำงาน

เป็นตัวควบคุมแบบ Manual โดยการใช้มือกดปุ่ม เพื่อให้ระบบทำงาน โดยมี 2 การควบคุม

1. สีเขียว ระบบเปิด
2. สีแดง ระบบปิด

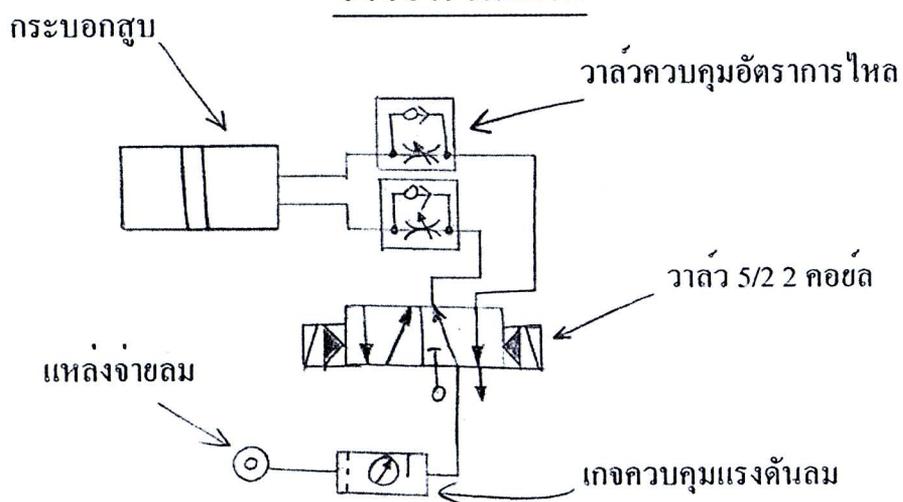
แหล่งจ่ายไฟ Power Supply



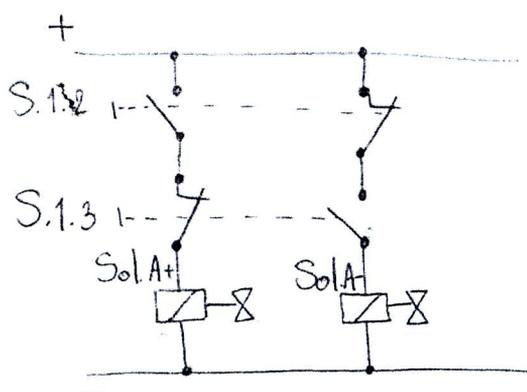
หลักการในการทำงาน

อุปกรณ์ตัวนี้มีหน้าที่แปลงกระแสไฟบ้านเพื่อนำมาใช้ทำงานในระบบ

วงจรมีวแมตติก



วงจรีไฟฟ้า



หลักการในการทำงาน

กด S.1.2 Sol.A+ ทำงาน

กด S.1.3 Sol.A- ทำงาน

กดพร้อมกัน ไม่มีไฟไปเลี้ยง Sol.A+ และ Sol.A-

ภาคผนวก ข
การนำเสนอผลงานวิจัย

ภาคผนวก ข
การนำเสนอผลงานวิจัย



STT37-0336



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Acknowledgement

Dear Chalerm Chaiyong

The secretariat committee of STT37 would like to inform you that we have received your STT37 registration information for ID: 0336 and e-mail address: max_88by88@hotmail.com
The secretariat committee of STT37 have received

Ordinary participant Participant with paper submission

We recieved the payment as cash bank transfered cheque bank
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Your submitted paper entitled **PNEUMATIC SYSTEM FOR THE REAL-TIME MECHANICAL STRESS-STRAIN CHARACTERISTICS OF SHORT AND LONG RICE KERNELS**
was reviewed from academic subcommittee of STT with the result:

- Poster
 Oral presentation (the presentation schedule can be checked at the uploaded files)
 Not accepted

Sincerely yours.

Associate Professor Dr. Thara at Supasiri

PNEUMATIC SYSTEM FOR THE REAL-TIME MECHANICAL STRESS-STRAIN CHARACTERISTICS OF SHORT AND LONG RICE KERNELS

Chalerm Chaiyawong¹, Kritsana Keawlawiang¹, Chittapon Sangkarat¹, Duongruitai Niconrat², Tongchai Chysiri³, Wannapong Triampo^{4,5,6}, Paisan Kanthang^{2,*}

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Abstract: During the rice processing, the possible situations of rice kernel cracking and breakage are commonly occurred and these consequences cause a low marketing price. According to this issue, the real-time observation and together with the knowledge base of mechanical properties should be essentially helpful in detection of these defect observations. The objective of this work was established to study the mechanical stress-strain properties of short and long rice kernels in terms of brown rice via our in-house pneumatic system design. From the results, it showed that the breaking forces were approximately 33.46 ± 12.46 N and 28.89 ± 15.18 N for Phitsanulok 2 and Khao'Yipun DOA1 respectively. We also found that stress-strain of Phitsanulok 2 were greater than Khao'Yipun DOA1. These results tentatively indicated the mechanical stress-strains occurred were from the difference of rice shapes. Moreover, we could recognize that the characteristics of these various shapes significantly followed the scaling law of the relation between strain and time.

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5. Lu, R., Siebenmorgen, T. J. (1995). *Trans. ASAE*. **38**, 889-894.

Acknowledgements: This work was supported by a grant from Rajamangala University of Technology Phra Nakhon and by Mahidol University (Faculty of Science), the Thailand Research Fund (TRF), and the Commission on Higher Education (CHE).

Keywords: Pneumatic system, Stress-Strain properties, Breaking forces, Rice shapes



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Acknowledgement

Dear Kritsana Keawlawiang

The secretariat committee of STT37 would like to inform you that we have received your STT37 registration information for ID: 0339 and e-mail address: golf_kkman@hotmail.com
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Your submitted paper entitled **THE MECHANICAL PROPERTIES FOR CLASSIFICATION OF FIVE COMMERCIAL RICE VARIETIES IN CHIANGRAI PROVINCE OF THAILAND** was reviewed from academic subcommittee of STT with the result:

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Sincerely yours.

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THE MECHANICAL PROPERTIES FOR CLASSIFICATION OF FIVE COMMERCIAL RICE VARIETIES IN CHIANGRAI PROVINCE OF THAILAND

Kritsana Keawlawiang¹, Chalerm Chaiyawong¹, Chittapon SangKrat¹, Duongruitai Niconrat², Tongchai Chysiri³, Wannapong Triampo^{4,5,6}, Paisan Kanthang^{2,*}

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Abstract: The objectives of this study were to classify the rice varieties with the mechanical properties via our Pneumatic Mechanical Tools (PnMT). These interesting properties included breaking force, deformation and stress-strain. The rice varieties (RD6, RD15, Khao' Yipun DOA1, Phitsanulok 2 and Khao Dawk Mali 105) contained moisture content of 20% w.b.. We found that the breaking force, deformation, stress-strain and modulus of elasticity were different in both features and values. Moreover, the time series data of stress-strain showed the rate of change in the difference of the breaking states. These results also indicated that the studied mechanical properties could clearly describe the sampling rice varieties. Therefore, with our tools, including the techniques as well as the results, the procedure obtained can be such a high potential approach that can be used for further developing in the quantitative classification of rice varieties.

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Acknowledgements: This work was supported by a grant from Rajamangala University of Technology Phra Nakhon and by Mahidol University (Faculty of Science), the Thailand Research Fund (TRF), and the Commission on Higher Education (CHE).

Keywords: Pneumatic Mechanical Tools, Stress-Strain properties, Breaking forces, rice varieties, rice classification



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Your submitted paper entitled **THE REAL-TIME ANALYSIS FOR THE MECHANICAL PROPERTIES OF RED BEAN GRAINS**
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Sincerely yours.

Associate Professor Dr. Thararat Supasiri

THE REAL-TIME ANALYSIS FOR THE MECHANICAL PROPERTIES OF RED BEAN GRAINS

Chittapon Sangkarat¹, Chalerm Chaiyawong¹, Kritsana Keawlawiang¹, Sapaya Thongpang¹, Peerapat Korkeattrakoon¹, Nitipat Eawsakui¹, Duongruitai Niconrat², Wannapong Triampo^{3,4,5}, Paisan Kanthang^{2,*}

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Abstract: Data on the physical and mechanical properties of seeds have significantly importance for most machinery and process equipment design. These properties include breaking force, deformation and stress-strain as well. This study was conducted to investigate the real-time mechanical properties of red bean grains via our design of the pneumatic mechanical tools (PnMT). The significant data revealed that the red bean grains mostly contained with moisture content of 20% w.b.. The average length, width and thickness were 6.2, 5.4 and 5.1 mm respectively. The results showed that breaking force, deformation and stress-strain were different in both features and values in most different applied force directions. In addition, we observed there were the relationship between strain and time. This followed the significant power law in all different force directions.

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1. Isik, E., Unal, H. (2007) *Journal of Food Engineering*. **82**, 209–216.
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Acknowledgements: This work was supported by a grant from Rajamangala University of Technology Phra Nakhon and also supported by Mahidol University (Faculty of Science), the Thailand Research Fund (TRF), and the Commission on Higher Education (CHE).

Keywords: pneumatic mechanical tools, stress-strain, deformation, red bean grains

